TimeFlash

Programmer User’s Guide

1. Introduction

This is the operation manual for the Microchip TimeFlash product.

The Microchip TimeFlash kit consists of the TimeFlash programmer, USB cable, antistatic tweezers, Quick Start guide & installation USB Flash drive.

Figure 1. Microchip TimeFlash kit

The Microchip TimeFlash programmer provides the following functions:

- Identify a device
- Program the Microchip family of MEMS oscillators
- Measure the frequency of a programmed part.

Included in the TimeFlash kit is a USB flash drive with the installation software. Once installed, the Microchip TimeFlash software will automatically download software updates as they become available.

An offline installation package is also included in the flash drive to installation to a PC without internet access.

Socket Daughter Cards (SDCs) are required for programming oscillators with the Microchip TimeFlash programmer. The SDCs accommodate each of the six form factors by simply providing a PCB extension to the programmer. For added convenience, the socket size is designated at the top of each card.

2. Using Microchip TimeFlash GUI

After installing the TimeFlash control software, execute the following steps to launch the application.
Navigate to the installation location of the program “Timeflash.exe” and then double click on the icon. For convenience, a “shortcut” of this icon in the Start Menu will ease continued use of the software. Initially the TimeFlash application will display a logo with a transparent background (see Figure 1) as a windows screen while the application is launching.

Figure 2. Microchip TimeFlash logo screen

When the software is loaded, the following screen will appear.

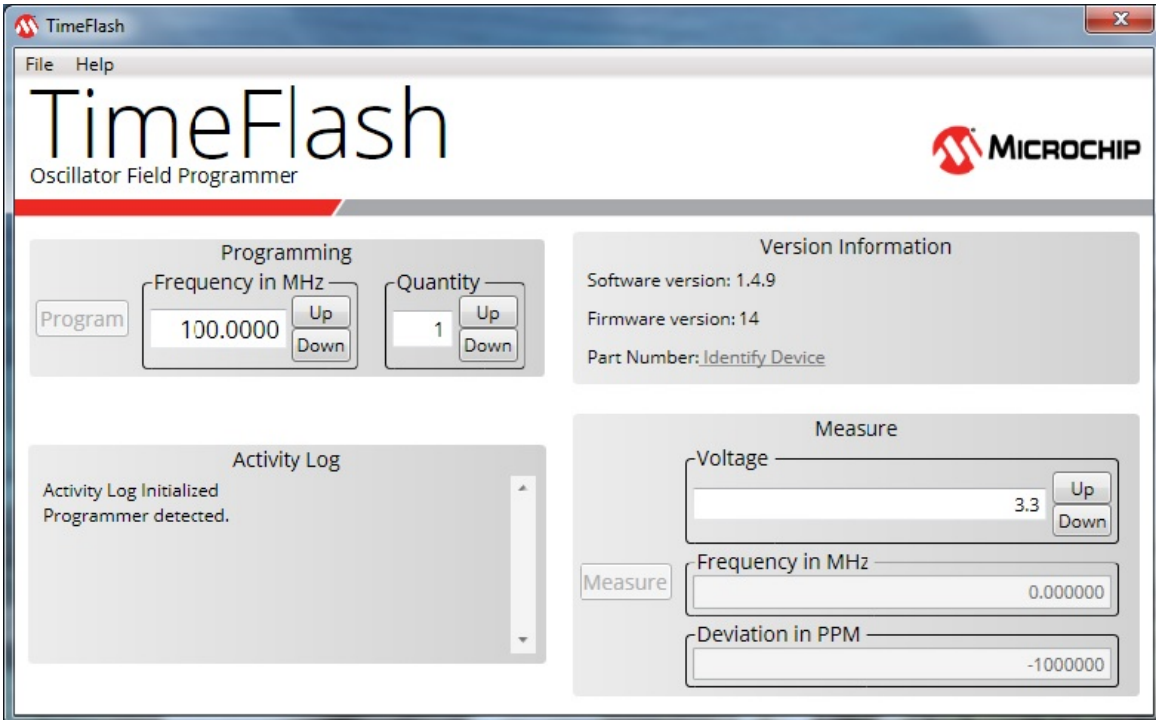

Figure 3. Microchip TimeFlash GUI

The version information pane displays the following information (see Figure 2 below):

Software version [G] is the version of TimeFlash software that is running in your PC.

Firmware Version **[F]** is the version of the control software that is currently running in the TimeFlash progamming module. If the module is not attached then it will be blank.

The part number **[E]** is the field that indicates the part number and package size of the blank component you currently have inserted in the socket daughter card. This field, when clicked, will identify the device.

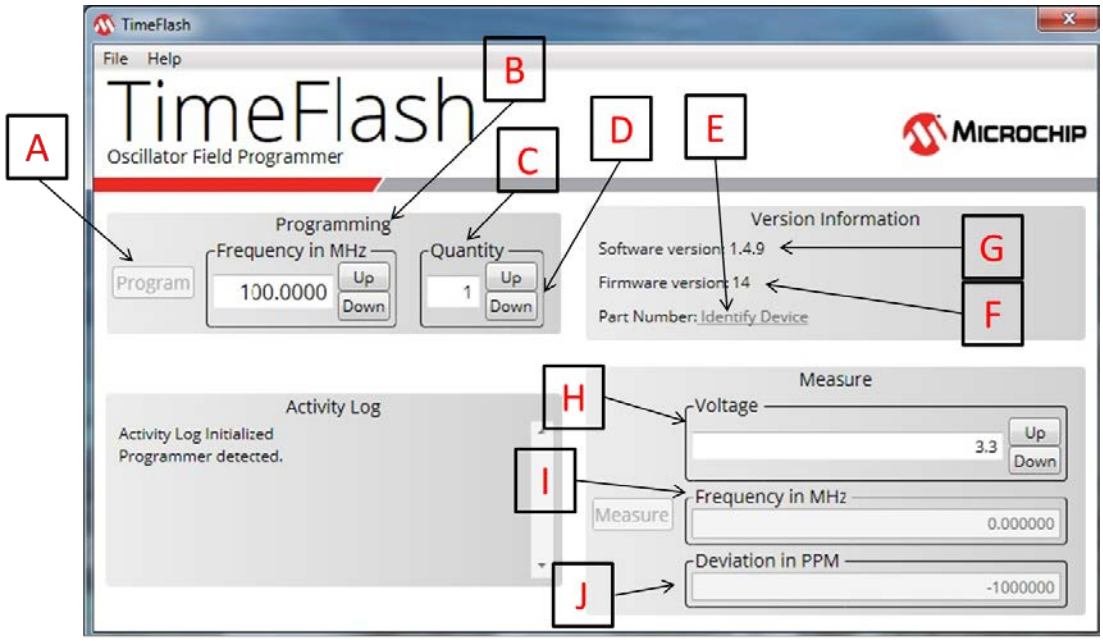

Figure 4: TimeFlash GUI features

NOTE: The items indicated in this figure will be referred to in the format of [*] later in this manual to reference their location on this screen. Thus [E] refers to the Part Number item in the Version Information pane of this screen

3. Identifying, Programming and Measurement Functionality

Identifying a device

To identify a device, simply click on the "Part Number" field (see **[E]** in Figure 2 above). Note that the field is disabled until a Socket Daughter Card is attached to the programmer.

Programming devices

- Plug the USB cord into any available USB port on your computer
- Plug the Microchip TimeFlash programming module into the micro USB end of the USB cable
- Plug the desired Socket Daughter Card into the TimeFlash progamming module. The correct orientation results in the socket of the Socket Daughter Card and LED's of the progamming module being on the same side of the assembled unit. If the Socket Daughter Card is inadvertently connected to the progamming module either 180 degrees rotated or offset from the correct alignment, no harm will be done to the units. Under this condition, **[E]** on the screen will not display a part number.

Note: Do not unplug components, Socket Daughter Cards or the USB cable during programming

- Launch the TimeFlash software on your PC and note the software version, programmer's firmware and part number are displayed and that the part number is correct for the part you are about to program.
- Using the supplied antistatic tweezers, place the component into the socket on the socket Daughter card

Note: There is a pin 1 designator printed in the corner of the socket card to assist in correctly aligning the component in the socket. If the component is inserted backwards, this condition will be detected and abort programming. The blank oscillator will not be damaged. Successive attempts to program a component that is inserted backwards will can lead to degraded performance of the component so it is advised to use care when inserting the components into the unit's socket.

- Using normal Microsoft Widows screen navigation techniques, select the "Frequency in MHz" numeric block in the "PROGRAMMING" window **[B]** of the software
- Type in or click on the spin buttons until the desired frequency is displayed.
- Check the "Quantity" **[C]** numeric block to insure that it displays "1". Operation for quantities greater than one will be discussed below in Sequential Programming of Multiple Devices.
- Click the programming button in this window **[A]**
- Wait for either the Busy (blue) LED on the programmer to extinguish or the finished message to appear in the "ACTIVITY LOG" screen window

The device has now been programmed!

Sequential Programming of Multiple Devices

- To program multiple devices to the same frequency, the "Quantity" **[C]** numeric block can be set to a number greater than 1 by pressing the up and down buttons **[D]**. The user may select a quantity count from 1 to 999. When the program button is pressed, the TimeFlash will program the part that is in its daughter card socket. When the part is successfully programmed, the counter will be decremented and the system will measure and display the frequency in the FREQUENCY area of the MEASURE pane **[I].**
- Using the supplied antistatic tweezers, place the next component into the socket on the Socket Daughter Card
- Click the programming button in this window **[A]** and observe that the counter decremented
- Continue repeating steps 2 & 3 until all devices are programmed.

If the device does not program, an error message appears in the "Activity Log" and the counter will NOT decremented.

Measuring the frequency of a programmed device

- Either type in the desired operating voltage for the programmed part or use the up and down buttons to adjust the voltage value **[H]**. If you use the buttons you will be selecting the standard voltages (1.8, 2.5, 2.8, 3.0 and 3.3 Volts. If you type in an absolute value, you can select any voltage (in 10 millivolt increments) from 1.8V to 3.3V. Using this method, frequency can be measured across the desired operating voltage range (Margining).
- Read the actual measured frequency **[I]** and PPM offset **[J]** from the desired frequency in the "MEASURE" pane.

Note: The PPM offset value in the MEASURE pane uses the frequency value displayed in the PROGAMMING pane as its 0PPM reference point.

4. Error messages

The following tables display the TimeFlash application error messages based on 3 classifications on severity: Information Only, Warning and Error.

Message Text	Message Type	Location	Pre-Condition
Downloading installer...	Information Only	Activity Log	Update link pressed by user
Installer was successfully downloaded.	Information Only	Activity Log	Downloading installer pointed by version.xml successful
Burn started.	Information Only	Activity Log	User pressed “Burn”
Burn complete.	Information Only	Activity Log	Programming was successful.
Measurement started.	Information Only	Activity Log	User pressed “Measure”
Measurement successful.	Information Only	Activity Log	Measurement successful
Programmer detected	Information Only	Activity Log	TimeFlash was connected and initialized successfully
Daughter Card detected	Information Only	Activity Log	A supported daughter card was connected
Daughter Card removed	Information Only	Activity Log	A daughter card was removed
Programmer removed	Information Only	Activity Log	TimeFlash was removed
Please replace the part with a blank one and press OK.	Information Only	Pop-up Dialog	When the quantity field is > 1 and programming an oscillator was successful, this dialog gives the user a chance to insert a new part.
Attempting to identify part.	Information Only	Activity Log	The programmer is now trying to determine the exact part number of the oscillator in the socket.

Table 1: Error Messages (1 of 3)

Message Text	Message Type	Location	Pre-Condition
Testing programmed part failed. Try doing a measurement.	Warning	Activity Log	Communication failure with the programmer while trying to measure the frequency of the oscillator after programming and power-cycle
This Socket Daughter Card does not support…	Warning	Activity Log	Legacy daughter cards do not support all oscillator families and all operations. Use the universal socket daughter cards or a different oscillator.
Not supported Daughter Card detected, check for application updates.	Warning	Activity Log	A not supported daughter card was connected
Could not download the installer.	Error	Activity Log	Downloading installer pointed by version.xml failed
Could not locate the installer. Update failed.	Error	Activity Log	The installer pointed by version.xml was not found or cannot be accessed
Part inserted backwards.	Error	Activity Log	An over-current was detected, probably because the oscillator was inserted backwards
No programmable part present.	Error	Activity Log	Communication failure with the oscillator while trying to calibrate the frequency
Burn failed, still programmable, re-burn same part.	Error	Activity Log	Communication failure with the oscillator while trying to measure the calibrated frequency
Burn failed, still programmable, re-burn same part.	Error	Activity Log	The deviation between the target and measured frequency is > 1000ppm

Table 2: Error Messages (2 of 3)

Message Text	Message Type	Location	Pre-Condition
Burn failed, discard part.	Error	Activity Log	OTP programming failed. Part most likely not re-usable
Could not cycle power. Unplug the programmer and reconnect.	Error	Activity Log	Turning power off/on failed.
Measurement failed.	Error	Activity Log	Communication failure with the programmer while trying to measure the frequency.
No oscillator was detected in socket.	Error	Activity Log	Communication failure with the oscillator. Most probably no oscillator in socket or not properly inserted.
Identification failed.	Error	Activity Log	Communication failure while attempting to identify the exact part number of the oscillator in the socket.

Table 3: Error Messages (3 of 3)