



# HexWax Explorer

TEAclipper firmware management utility

## Summary

HexWax Explorer is a firmware management utility for TEAclipper programming clips. It allows TEAclippers to be charged with firmware stored locally or available over the internet as [www.hexwax.com](http://www.hexwax.com).

Technical support information such as data sheets, web links, bills of materials, etc, can be grouped together into Firmware Packs for delivery to other users of HexWax Explorer, or in anticipation of publication on [www.hexwax.com](http://www.hexwax.com).

HexWax Explorer is available as a free download from [www.hexwax.com](http://www.hexwax.com). A TEAclipper USB adapter is required in order to connect to TEAclipper programming clips. These are available from distributors of FlexiPanel products.

## Installation

If you have not already done so, download the installation program from [www.hexwax.com](http://www.hexwax.com) and install HexWax Explorer onto your PC.

Insert the TEAclipper USB adapter into a USB socket. If required, specify the driver information file `TEAclipper USB.inf`, which is located in the same directory as HexWax Explorer.

You need to tell HexWax Explorer which COM port TEAclipper USB is using. To determine this:

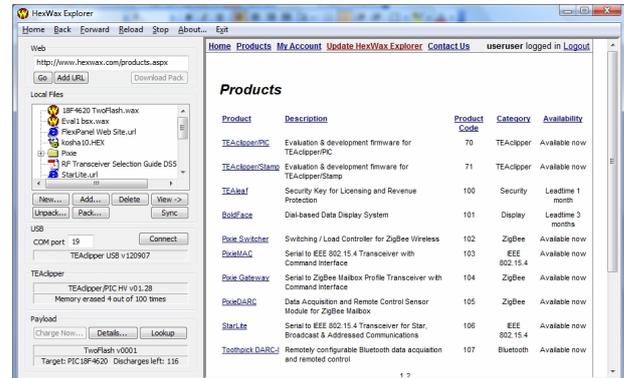
1. Click on Start
2. Right click on My Computer, select Properties
3. Click on the Hardware tab, press the Device Manager button.
4. Open the Ports (COM & LPT) section. You will see the device name TEAclipper USB and the COM port number.
5. Enter the COM port number in the USB section of HexWax Explorer and press Connect. The status window will indicate the TEAclipper USB version number.

USB

COM port

TEAclipper USB v240107

Note: If you insert TEAclipper USB into a different socket, a different COM port number is assigned.



## User Guide

Before you can load firmware onto a TEAclipper you must import it into the Local storage area. You can use the Add and New buttons to import a firmware file on your computer into the Local area.

You can also download firmware from the [www.hexwax.com](http://www.hexwax.com) web site. For an initial evaluation we suggest you download the TEAclipper Stamp Eval or TEAclipper PIC Eval firmware from [www.hexwax.com](http://www.hexwax.com).

To charge a TEAclipper with firmware, insert it into the USB adapter. The TEAclipper and Payload windows will indicate if it has been detected. If it does not detect it within a few seconds, press Connect.

Next, in the Local window, select the firmware that you wish to load onto the TEAclipper and press the *Charge Now...* button. A Charge TEAclipper dialog will appear. Press OK to load the payload onto the TEAclipper.



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## User Interface Reference

### Explorer View

On startup, the main screen is the Explorer View. It is a web browser based on Microsoft's Internet Explorer. Features specific to TEAclippers have been added in a control panel to the left.

The menu items **Home**, **Back**, **Forward**, **Reload**, **Stop**, **About** and **Exit** perform the usual functions you would expect in a web browser.

### Web Controls

The **Web** section of the control panel controls the navigation of the web browser. To navigate to a page, enter the URL in the edit box provided and press **Go**. To search [www.hexax.com](http://www.hexax.com) with Google, type the search terms in the box and click on **Search HexWax.com**. To add a web page to your local storage area, press **Add URL**.

If you leave HexWax Explorer idle for a long period, your web site session may terminate and the web server will think you are using a web browser other than HexWax Explorer. In this state it will not let you download firmware packs. If this situation arises, simply press the **Restore Session** button.

### Downloading Packs

When you are on HexWax product pages, you may be permitted to download product packs. A downloaded pack can contain more than just firmware. It may also contain data sheets, circuit diagrams, *etc.*

### Local Controls

The **Local** section of the control panel displays the files stored in your local storage area. This is located in a sub-folder named Local located in the same folder as the HexWax Explorer application.

Double-clicking on most files in the local window will launch the file to the browser area. In the example pictured above, an Adobe PDF file has been clicked on and has been launched. Files with the blue Microsoft Internet Explorer logo are URL links. Double-clicking on them will navigate to the URL. Double-clicking on a folder opens or closes that folder within the local view. Double-clicking on firmware files has no effect.

Press **New** to create a new folder at the currently selected location. Press **Unpack** to unpack a firmware pack to the currently selected location. To pack a folder of files, select the folder and press

**Pack**. Firmware Packs are usually stored in the sub-folder named Packs located in the same folder as the HexWax Explorer application.

The **Add** button allows you to copy a file from another location on your computer and insert the copy at the currently selected location. Pressing **Delete** will delete the currently selected file.

The **View** button has the same effect as double-clicking except in the case of folders. In their case, the folder is launched into the browser view for more flexible file manipulation. If you change the local file structure within the browser view, or outside the application entirely, press **Sync** to refresh the local view.

### USB Controls

The **USB** section of the control panel displays the status of the connection to the TEAclipper USB programming adapter. The TEAclipper USB is used to deliver data to TEAclippers, and to find out what is stored on them.

Occasionally inserting and removing TEAclippers can disrupt the USB connection. In this event, simply press the **Connect** button once more.

### TEAclipper Controls

The **TEAclipper** section of the control panel displays the status of the TEAclipper, including the target it has been designed for, the firmware version number, and then number of times the flash memory as been erased.

The **Payload** section of the control panel displays the status of the firmware payload currently on the TEAclipper, including the name, version and target microcontroller. If the payload may only be discharged a limited number of times, the number of remaining discharges will also be displayed.

When a firmware file is selected in the Local view, press **Charge Now...** to load that firmware into the TEAclipper. This button will be grayed out if the firmware selected is not suitable for the TEAclipper. Press **Lookup** to launch the web page associated with the payload into the browser view.

### Charge TEAclipper Dialog

The Charge TEAclipper Settings dialog is displayed when you are about to write an unencrypted payload to a TEAclipper. The options vary slightly between Stamp and PIC, and on the on the target device, and may include:

**Target PIC:** Specifies the type of PIC for which the hex data is intended. This information is not

contained in .hex files and so must be specified here. It is not always possible to cross-check that the PIC type is correct, so be careful to set it correctly.

Either high-voltage or low-voltage programming may be specified, depending on the target device. Some PICs require high-voltage (13V) programming; others require low-voltage programming; some may be programmed by either method. High-voltage programming is only possible using TEAclippers incorporating high-voltage generator components.

If low-voltage programming is specified, there may be a supply voltage minimum below which bulk erase operations cannot be performed. Programming is only possible below this limit with high voltage erase.

LF series devices identical to F series are identical to F series devices, e.g. PIC18LF4520 is the same as PIC18F4520, except that LF series devices may be operated at lower voltage. To specify an LF device, simply specify its F series equivalent.

**Serialization:** Serialization options allow you to set certain memory locations to unique values.

For BASIC Stamp targets, the memory locations may not cross a 16-byte boundary. Locations 0x0000 – 0x1FFF refer to Slot 0, locations 0x2000 – 0x3FFF refer to Slot 1, etc.

For PIC targets, the memory locations may not cross a page write-byte boundary and must be word aligned.

In either case dummy values must be declared in the source code for these locations. When the TEAclipper attempts to write the dummy values, it will substitute the serialization values.

The values can be stored directly or as literals in RETLW instruction (i.e. in the same manner as the Microchip PM3 SQTP facility programmer).

**Fixed:** A fixed value of up to 4 bytes (Stamps) or 16 bytes (PICs) to each target during programming. This option requires limited discharge to be enabled.

**Random:** A random value of up to 16 bytes to each target during programming. This option requires limited discharge to be enabled.

**Increment:** An incrementing value of up to 4 bytes (Stamps) or 16 bytes (PICs) to each target during programming. This option requires limited discharge to be enabled. The value is written little-endian, i.e. least significant byte first. Note that PIC increments do not carry beyond the fourth byte.

**Limited Discharge:** Allows you to limit the number of discharges of the payload for licensing purposes.

Note that each 16 discharges will require an erase cycle.

**Payload name:** This name will appear in the Explorer view Payload information area when the TEAclipper is inserted into the TEAclipper USB adapter.

**Version number:** If non-zero, this version number will appear in the Explorer view Payload information area when the TEAclipper is inserted into the TEAclipper USB adapter. The value is a two-byte hex number.

**URL:** The URL which will be navigated to when the TEAclipper is inserted into the TEAclipper USB adapter and the Lookup button is pressed.

**After Programming:** Specify whether the TEAclipper should hold the target in a reset state until it is removed, or whether to tri-state immediately and allow the target to execute.

**Security Options:** Specify whether or not the serialization information can be read out of the TEAclipper.

**Checksums:** The checksums are a shorthand method of verifying that you have the correct payload and dialog settings. (They are not the same checksums as used by MPLAB.)

**Preserve / Authenticate:** You have the options of leaving certain areas of ROM or EEPROM unchanged during programming (preserve), or of only programming if the ROM or EEPROM locations match the values specified in the hex file (authenticate). The first of these options is useful if you wish to leave serial numbers, MAC addresses, calibration data unchanged. The second is useful when upgrading to ensure that the right target device is being upgraded.

Note for 10F, 12F and 16F devices, two bytes are used for each 12-bit or 14-bit ROM location and each 8-bit EEPROM location. Addresses are specified in bytes, so address values and lengths may be double what you would expect.

Dummy values must be declared in the source code for the preserve / authenticate memory locations.

Preserve / Authenticate of code protected ROM is not possible.

**Override High Voltage Defaults:** Refer to High Voltage Programming section below.

**Embed Settings:** Writes settings to hex file so if another user opens the file, it will default to the settings selected.

## Copyright

TEAclippers can be used as a licensing system to allow firmware to be bought and sold. When used in this way, trade is protected by the WIPO Copyright Treaty and the Digital Millennium Copyright Act. The following are punishable by fines or imprisonment:

- Any attempt to interfere with the programming process or intercept or record or reproduce the programming signals
- Any attempt to disseminate unlicensed copies of firmware carried by TEAclippers