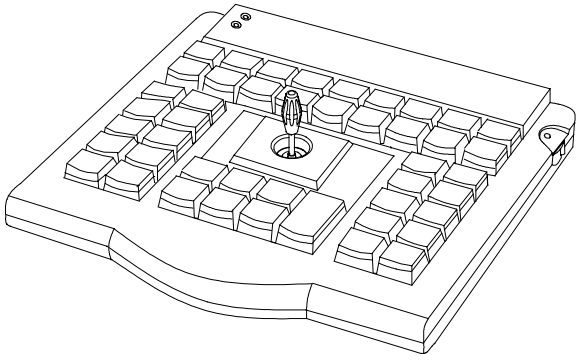
X-keys® *Controller*

Integrated Joystick and
Programmable Keyboard by

P.I. Engineering, Inc.



Preliminary

Product Manual

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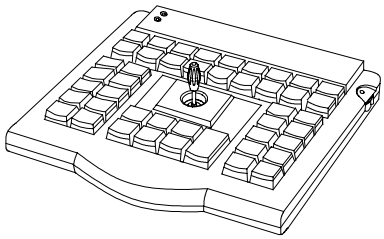
"The No Slogan Company"

February, 03

X-keys® *Controller*



The ***X-keys*** ***Controller*** **(USB)** is a programmable keyboard with an integrated joystick. Using our patented MDM™ technology, a non-contact measurement technique, the joystick provides precise, reliable control without potentiometers or optics.

Two modes of operation are available for the X-keys Controller. In Keyboard HID mode the X-keys stores keystrokes and commands in non-volatile memory and the joystick installs as a an HID Game Controller. Selecting Special HID Input (SPLAT) mode gives the developer exclusive access to all 46 switches and the X,Y, and Z data from the joystick. An addendum to this manual is available for those who wish to program the controller in SPLAT mode.

Installing the ***X-keys*** Controller on Your USB Compatible PC

To simplify the installation process, we recommend running our installation program before plugging the X-keys into your computer.

To install and run in normal operating mode the ***X-keys Controller*** requires three drivers: 1) a USB Composite Device Driver, 2) a HID driver for the keyboard 3) a HID game controller driver for the joystick. These are all Windows standard drivers, normally installed with the Windows Operating System.

When the programming switch is in the "Programming Mode" position, the programmable keys require the USB driver we have provided. The joystick is not programmable and is not affected by the position of the programming switch.

The following procedures will guide you through installing all necessary drivers.

Installation with Windows:

NOTE: Installation is essentially the same in all versions of Windows. Windows 98 and Me require more input from the user. In all cases, watch the hourglass and allow time for each step to be completed before proceeding to the next. If you encounter problems, please contact our tech support department: E-mail: tech@ymouse.com, Phone: 1-517-655-5523.

1. Start with the X-keys unplugged.
2. Insert the ***X-keys*** USB Driver CD into your CD-ROM drive.
3. Run "xkeyswxp.exe" and follow the instructions from the installation wizard.
4. Make sure the Programming switch on the X-keys is in operating position (down, black dot showing), and plug the X-keys into a USB port.
5. Windows will install a composite device driver for the X-keys Controller, followed by an HID driver for the keyboard and a second HID driver for the joystick.
6. Slide the programming switch on the ***X-keys*** up into the programming position (red spot visible). Both layer indicators will light.
7. Windows will install the programming driver for the ***X-keys*** When the installation is complete, the red indicator will turn off leaving the green indicator blinking to assure you that the ***X-keys*** is ready for programming.

8. The installation is complete. You may remove the CD from the drive. You are now ready to program the ***X-keys*** using the instructions on the following pages.

Installing the *X-keys* Controller on Your USB Macintosh

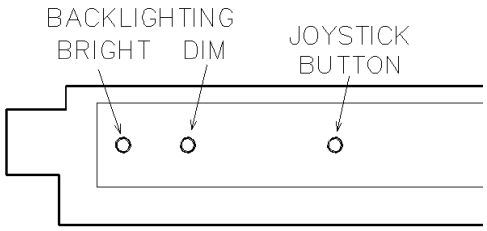
1. Plug the ***X-keys*** into an available USB port.
2. Insert the ***X-keys*** CD in the CD-ROM drive.
3. Double-click the ***X-keys*** icon when it appears on the desktop.
4. Open the hard drive by double-clicking the hard drive icon.
5. When the hard drive window opens, scroll down to the "System Folder."
6. Drag the USBxKEY icon to the "System Folder."
7. When asked if you want to put "USBXKEY" in the "Extension Folder", click OK
8. Installation is now complete. Close the windows that are open on the desktop. When the windows are closed, remove the CD-ROM from the drive by highlighting the ***X-keys*** icon, clicking "Special" on the menu bar and clicking "Eject" from the list (or drag the CD icon to "Trash").
9. The ***X-keys*** is now ready to program using the instructions on the following pages.

ERROR MESSAGE for Macintosh Users: If the ***X-keys*** is in programming mode and the software is not installed, an error message will appear that says the software cannot be found – click OK and install the software following the instructions above.

NOTE: The MDM™ joystick will install and be recognized as a standard joystick.

Back-lighting levels on the *X-keys Controller*

The buttons on the back panel (see diagram below) step the back lighting LEDs through the available levels of brightness. Once set the back-lighting level is retained in memory.



Back Panel of X-keys Controller

Using an object with a blunt point (such as a ball point pen or the end of a paper clip) tap the recessed buttons to brighten or dim the LEDs. Holding the "BRIGHT" button down will quickly run through the steps to the maximum level of brightness. Holding the "DIM" button down will step the level down to the minimum "OFF" level.

Calibrating the Joystick on Your *X-keys Controller*

Calibration of the MDM™ joystick is not required. Certain software programs may ask you to perform a calibration procedure regardless, and for this reason we have provided access to a dedicated joystick button on the back panel (see diagram above).

Programming the *X-keys*

NOTE: The layer indicator has three basic patterns: steady glow indicates normal operation, slow blink indicates "Programming Mode," and double-blink indicates you are programming a selected key.

1. In order to program the ***X-keys*** the standard keyboard must be attached to the computer along with the ***X-keys***. If the ***X-keys*** will be a standalone keyboard, remove the standard keyboard after programming is complete.
2. It is a good idea to open the application(s) that the programmed keys will replay – this makes it easy to test the keys during and after programming.
3. Slide the programming switch on the ***X-keys*** to the programming position (a red indicator will be visible to the left of the switch). The green (or red) layer indicator light on the ***X-keys*** will blink, which lets you know which layer you are programming.
4. Tap the key on the ***X-keys*** that you want to program. The green (or red) layer indicator will double-flash.
5. Type (on the standard keyboard) the key sequences and/or key combinations to program into the key on the ***X-keys***. During programming, the monitor will display any alphanumeric keys typed or if you are entering commands the application will perform the function(s) entered.
6. When the sequence is complete, tap the key on the ***X-keys*** again. As in step 3, the green or red layer indicator will blink.
7. Repeat steps 4, 5, and 6 to program the rest of the keys on the ***X-keys***. If you make a mistake on a key, tap it once to stop the programming and then tap it again (step 4) and re-program it with the correct keystrokes.
8. When programming is complete, slide the programming switch back to the operating position. The ***X-keys*** is ready for your use and enjoyment.

Operation

Use the standard keyboard and the ***X-keys Controller*** together at any time.

The joystick operates as an HID Game Controller. Rotation of the stick in either direction gives unlimited access to the Z axis. Rotating the stick clockwise increases the Z value reported to the HID game controller and the value passes from 100% to 0 every 360º.

NOTE: While the ***X-keys*** is in programming mode without a key selected, keystrokes and commands from the standard keyboard will not pass through to your application. In addition, an ***X-keys*** in programming mode will not boot-up the computer.

Special HID Input (SPLAT) Mode Programming

Developers can use special HID input or "SPLAT" mode to send commands specific to their software from each of the 46 keys and X,Y, and Z values from the joystick. A developers kit is available. Please look in the OEM section of our website or contact tech support for more information.

Additional Instructions for Special Programming Features

In addition to saving keystrokes, you may be interested in features like programming different layers, programming separate commands for press and release of a key, and inserting pauses. These special programming features are summarized in a table at the end of this section.

Single Key Special Programming Features

Programming Joystick Buttons:

The X-keys Controller is shipped with the eight keys below the joystick programmed as joystick buttons 1-8. These keys may be reprogrammed and other keys on the controller may be programmed to perform joystick button functions.

To program the first joystick button on a key:

1. Slide the programming switch to put the ***X-keys*** into programming mode. The green layer indicator will blink.
2. Tap the key that you want to program. The green layer indicator will double-blink.
3. Press and hold the <Esc> key
4. Tap the <J> key
5. Tap the <1> key (above the Tab) on the alphanumeric section of the standard keyboard.
6. Release the <Esc> key
7. The green layer indicator on the ***X-keys*** will blink rapidly to confirm that the command was accepted (if you have a sound card properly configured, you will also hear a series of descending tones).
8. Slide the programming switch back to the operating position.

Additional joystick buttons 2 – 8 may be programmed by substituting the appropriate number in step 5 above.

Programming a Layer-toggle Key:

To switch to another layer, one key must be a dedicated layer-toggle switch. This may be any key, but program it *before* programming the second layer. To program a layer toggle key:

9. Slide the programming switch to put the ***X-keys*** into programming mode. The green layer indicator will blink.
10. Tap the key that you want to program. The green layer indicator will double-blink.
11. Press and hold the <Esc> key on the standard keyboard.
12. Tap the <2> key on the alphanumeric section of the standard keyboard (above the Q).
13. Release the <Esc> key.
14. The green layer indicator on the ***X-keys*** will blink rapidly to confirm that the command was accepted (if you have a sound card properly configured, you will also hear a series of descending tones).
15. Slide the programming switch back to the operating position.

To Program a Second Layer:

1. After programming a layer-toggle key (see above), change to the second layer by tapping the layer-toggle key. The ***X-keys*** must be in operating mode, not programming mode, to change to the second layer. The green or red layer indicator on the ***X-keys*** will glow indicating which layer is active.
2. Slide the programming switch to put the ***X-keys*** into programming mode. The appropriate layer indicator will blink.
3. Continue to program the second layer as described on page 3, but do not reprogram the layer-toggle key or you will not be able to change layers.

Programming a Layer-shift Key:

A layer-shift key works like the shift key on a standard keyboard. In the case of the ***X-keys USB X-keys***, you hold down the layer-shift key to use the other layer of keys. The layer-shift key may

be any key. If you wish to use the second layer only with a layer-shift key, rather than a layer-toggle key, change the layer-toggle key to a layer-shift key after programming the second layer. To program a layer-shift key:

1. Slide the programming switch left to put the ***X-keys*** into programming mode. The green layer indicator will blink.
2. Tap the key that you want to program. The green layer indicator will double-blink.
3. Press and hold the <Esc> key on the standard keyboard.
4. Tap the <1> key on the alphanumeric section of the standard keyboard (above the Tab key).
5. Release the <Esc> key.
6. The green layer indicator on the ***X-keys*** will blink rapidly to confirm that the command was accepted (if you have a sound card properly configured, you will also hear a series of descending tones).
7. Slide the programming switch back to the operating position.

Repeating Keys:

Keys on the ***X-keys*** are not automatically repeating keys, but it's easy to program them to repeat like the alphanumeric keys on the standard keyboard. To make a key a repeating (typematic) key:

1. Slide the programming switch to put the ***X-keys*** into programming mode. The layer indicator will blink.
2. Tap the key that you want to program. The layer indicator will double-blink.
3. Press and hold the <Esc> key on the standard keyboard.
4. Tap the <left-shift> key on the standard keyboard.
5. Release the <Esc> key (if you have a sound card properly configured, you will hear a series of descending tones).
6. Type the key sequences and/or key combinations you wish to program into the key. The application you are running will perform functions or display text as if the ***X-keys*** were not present.
7. When you have completed the sequence, tap the same key again. The layer indicator on the ***X-keys*** will change back to blinking.
8. Slide the programming switch back to the operating position.

Programming Separate Press and Release Commands:

The ***X-keys*** can generate one command when a key is pressed and another when released. For example, a key could type <A> when pressed and <B> when released. To program a key with separate press and release commands:

1. Slide the programming switch to put the ***X-keys*** into programming mode. The layer indicator will blink.
2. Tap the key that you want to program. The layer indicator will double-blink.
3. Type the key sequences and/or key combinations you wish to program into the "press" function of the key. The application you are running will perform functions or display text as if the ***X-keys*** were not present.
4. Press and hold the <Esc> key on the standard keyboard.
5. Tap the <left-Ctrl> key on the standard keyboard.
6. Release the <Esc> key (if you have a sound card properly configured, you will hear a series of descending tones).
7. Type the key sequences and/or key combinations you wish to program into the "release" function of the key. The application you are running will perform functions or display text as if the ***X-keys*** were not present.

8. When you have completed the sequence, tap the same key again. The layer indicator on the ***X-keys*** will change back to blinking.
9. Slide the programming switch back to the operating position.

Programming a Pause:

Regardless of the speed with which keystrokes are entered when programming the ***X-keys,*** the sequence is played back faster than most users can type. Sometimes it may be useful to pause after or between keystrokes so the associated software can register the command (this is particularly useful when the command opens a window).

NOTE: If all of the keystrokes are too fast, see the topic **"Slow Transmission Speed"** below.

To program a pause into a key:

1. Slide the programming switch to put the ***X-keys*** into programming mode. The layer indicator will blink.
2. Tap the key that you want to program. The layer indicator will double-blink.
3. Type the key sequences and/or key combinations you wish to program into the key before the pause. The application you are running will perform functions or display text as if the ***X-keys*** were not present.
4. When you reach the point in your sequence where you wish to insert a pause, press and hold the <Esc> key on the standard keyboard.
5. Tap the <5> key (above the R) on the alpha-numeric section of the standard keyboard.
6. Release the <Esc> key (if you have a sound card properly configured, you will hear a series of descending tones).

NOTE: The ***X-keys*** will insert a 1/2 second pause for each "<Esc>hold <5> <Esc>release" sequence entered.

7. Type the key sequences and/or key combinations you wish to program into the key after the pause. The application you are running will perform functions or display text as if the ***X-keys*** were not present.
8. When you have completed the sequence, tap the same key again. The layer indicator on the ***X-keys*** will change back to blinking.
9. Slide the programming switch back to the operating position.

NOTE: Up to four pauses may be used in a programming sequence.

Erasing a Key:

Reprogramming a key on the ***X-keys*** automatically erases the previously saved keystrokes. To erase a key and leave it blank:

1. Slide the programming switch to put the ***X-keys*** into programming mode. The layer indicator will blink.
2. Tap the key you want to erase. The layer indicator will double-blink.
3. Tap the <Esc> key three times. The layer indicator will blink rapidly confirming that the command was accepted (if you have a sound card properly configured, you will also hear a series of descending tones).
4. Tap the key again. The layer indicator will return to blinking.

Entire Keyboard Special Programming Features

These features affect the entire unit and include changing the transmission speed, changing the Caps Lock memory and erasing the unit.

NOTE: P.I. Engineering offers software which allows programming data to be copied from one ***X-keys*** to multiple units. Contact Tech Support for more information.

Slow Transmission Speed:

Some applications or systems have a slower response time and the default ***X-keys*** speed is too fast. To slow the rate at which the ***X-keys*** sends key commands:

1. Slide the programming switch to put the ***X-keys*** into programming mode. The layer indicator will blink.
2. Tap any key. The layer indicator will double-blink. **NOTE:** If you saved keystrokes on the key before, it will need to be re-programmed after programming the **Slow Transmission Speed** command.
3. Press and hold the <Esc> key on the standard keyboard.
4. Tap the <3> key (above the W) on the alphanumeric section of the standard keyboard.
5. Release the <Esc> key. The layer indicator will blink confirming that the command was accepted (if you have a sound card properly configured, you will also hear a series of descending tones).
6. Tap the key again. The ***X-keys*** is now ready to program.

Normal Transmission Speed:

Normal Transmission Speed is the default for the ***X-keys***. If you previously programmed Slow Transmission Speed and you want to return the ***X-keys*** to the default Normal Transmission Speed, follow the instructions above using <4> (above the E) in place of the <3> key.

Caps Lock Special Programming Features

The next three features effect how the ***X-keys*** recognizes Caps Lock and Unlock. The first two are specific to certain languages (i.e., English, French, etc.). These features enable the ***X-keys*** to remember whether Caps Lock was on when saving keystrokes, which frees the user from having to pay attention to the current mode of the standard keyboard when using the ***X-keys***. Caps Lock/Unlock Memory and Caps Lock/Shift Unlock Memory are useful if you want to save keystrokes that are case sensitive (like names and addresses). It is best to program a Caps Lock feature *before* programming the rest of the ***X-keys*****.**

Caps Lock/Unlock Memory:

Caps Lock/Unlock Memory works in languages (such as United States English, Latin American Spanish, etc.) that use the Caps Lock key both to turn Caps Lock on and off. To program Caps Lock/Unlock Memory:

1. Slide the programming switch to put the ***X-keys*** into programming mode. The layer indicator will blink.
2. Tap any key on the ***X-keys***. The layer indicator will double-blink. **NOTE:** If you saved keystrokes on the key before, it will need to be re-programmed after entering the Slow Transmission Speed command.
3. Press and hold the <Esc> key on the standard keyboard.
4. Tap the <8> key (above the U) on the alphanumeric section of the standard keyboard.
5. Release the <Esc> key. The layer indicator will blink confirming that the command was accepted (if you have a sound card properly configured, you will also hear a series of descending tones).
6. Tap the key again. The ***X-keys*** is now ready to program.

Caps Lock/Shift Unlock Memory:

Caps Lock/Shift Unlock Memory is for languages (German, French, etc.) that use the Caps Lock key to turn Caps Lock on and the shift key to turn Caps Lock off. To program Caps Lock/Shift Unlock Memory follow the instructions above using <9> (above the I) in place of the <8> key.

No Caps Lock Memory:

No Caps Lock Memory is the default for the ***X-keys***. If you programmed the ***X-keys*** with either of the two previous features and you want to return to the default state, follow the instructions above using <7> (above the Y) in place of the <9> key.

Resetting the Keyboard:

Resetting the ***X-keys*** removes all programming from all switches on both layers and returns the ***X-keys*** to a completely un-programmed state.

To erase the entire ***X-keys*** on a Macintosh computer: put the unit into programming mode, tap any key on the ***X-keys,*** and type, <esc> <delete> <esc> <esc> <esc> on the standard keyboard. If you have a sound card properly configured, you will hear a series of descending tones after a 3-second delay.

To erase the entire unit on a PC: put the unit into programming mode, tap any key on the ***X-keys,*** and type, <Esc> <Backspace> <Esc> <Esc> <Esc> on the standard keyboard. If you have a sound card properly configured, you will hear a series of descending tones after a 3-second delay.

Program Errors:

If the ***X-keys*** encounters program errors, the red and green layer indicators will blink simultaneously on and off. Turn the program switch off then back on to reset the ***X-keys*** to program mode.

Errors can occur if:

a) There is an unreliable cable connection, check all cords for proper connection.

b) The computer is not operating in a mode to accept the entered keys (for example, pressing <Ctrl>, <Alt> and <Delete> may cause a PC to reboot and the ***X-keys*** will not boot-up in program mode).

c) You tried to save too many keystrokes into the ***X-keys***. This is unlikely, but if you think that too many commands were entered, retry with a shorter key sequence.

Box Contents

- ***X-keys Controller***
- Two vertical double-keys*
- One horizontal double-key*
- One key-puller*
- One keyboard connector
- Instruction manual and CD-ROM

Additional Accessories**

- Basic Accessory Pack:
  - ✓ Two vertical double-keys
  - ✓ One horizontal double-key
  - ✓ One key-puller
- Vertical Keys Pack (10 vertical double-keys)
- Horizontal Keys Pack (10 horizontal double-keys)
- Square Key Pack (4 square keys (one square key replaces 4 single keys))

*****Available directly from P.I. Engineering***

Electronic design: P.I. Engineering, Inc., Williamston, Michigan
Keyboard industrial design: Reinhold Weiss Design, Chicago, Illinois
Patent Pending

Special Programming Features Table

Once you are familiar with the previously described special programming features, the following list of keystrokes may be a useful reference.

Command Symbol Legend

- ⬇ indicates when to press and hold a key down
- ⮟ indicates when to tap a key
- ⬆ indicates when to release the key.

NOTE: Numbers between chevrons (< >) are on the alphanumeric section of the keyboard not the number pad.

Single Key Programming Features	
Feature	**Associated Keystrokes**
Joystick button (# = button #)	⬇<Esc> ⮟<J> ⮟<#> ⬆<Esc>
Layer-toggle	⬇<Esc> ⮟<2> ⬆<Esc>
Layer-shift	⬇<Esc> ⮟<1> ⬆<Esc>
Repeating Key	⬇<Esc> ⮟<Left-Shift> ⬆<Esc>
Separate Press and Release	⬇<Esc> ⮟<Left-Ctrl> ⬆<Esc>
Pause	⬇<Esc> ⮟<5> ⬆<Esc>
Erasing a Key	⮟<Esc> ⮟<Esc> ⮟<Esc>
Entire Keyboard Programming Features	
Feature	**Associated Keystrokes**
Slow Transmission Speed	⬇<Esc> ⮟<3> ⬆<Esc>
Normal Speed	⬇<Esc> ⮟<4> ⬆<Esc>
Caps Lock/Unlock Memory	⬇<Esc> ⮟<8> ⬆<Esc>
Caps Lock/Shift Unlock Memory	⬇<Esc> ⮟<9> ⬆<Esc>
No Caps Lock Memory	⬇<Esc> ⮟<7> ⬆<Esc>
Resetting the Keyboard (PC)	⮟<Esc> ⮟<Backspace> ⮟<Esc> ⮟<Esc> ⮟<Esc>
Resetting the Keyboard (Macintosh)	⮟<esc> ⮟<delete> ⮟<esc> ⮟<esc> ⮟<esc>

Horizontal and Vertical Double-keys:

Various assortments of horizontal, vertical and large square replacement keys are available from P.I. Engineering. Horizontal and/or vertical double-keys can replace two single keys on the ***X-keys Controller*** . Remove two adjacent keys, with the provided key-puller by positioning the key-puller teeth under the key and pulling straight up on the key cap. Press the double-key in place over the two exposed switch stems.

NOTE: If the individual keys were programmed before, erase both before installing a double-key.

*Labeling your **X-keys**:*

A sheet of lined paper is included with your ***X-keys*** for making hand written key legends, or use your software of choice to create a grid of ½" x ½" squares and fill them with text. Templates formatted for some commonly used programs are available on our website in the "Drivers Plus" section of "Tech Support."

FCC Declaration of Conformity

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Limited Warranty

For all ***X-keys*** products purchased and installed in the United States and Canada, P.I. Engineering warrants that the ***X-keys*** product will be free from defects in materials and workmanship under normal use and service, and will meet the specifications presented by P.I. Engineering at the time of original purchase, for one year as evidenced by a copy of the purchase receipt. Under this warranty, P.I. Engineering will, at its sole option, repair or replace any ***X-keys*** product which is defective, provided that you are responsible for (i) the cost of transportation of the product to P.I. Engineering or its designated service facility, and (ii) any loss or damage to the product resulting from such transportation.

Upon discovery of a defect in the product within the Warranty Period, you should notify P.I. Engineering Technical Support via telephone to obtain an RMA (return authorization number) and instructions for shipping the product to a service location designated by P.I. Engineering. You should send the product, shipping charges prepaid, to the designated location, accompanied by the return authorization number, your name, address, and telephone number, proof of purchase, and a description of the defect. P.I. Engineering will pay for return of product(s) to the customer.

P.I. Engineering shall have no responsibility to repair or replace the ***X-keys*** product if the failure has resulted from accident, abuse, mutilation, misuse, or repair/modification performed by any entity other than P.I. Engineering.

THIS WARRANTY IS EXCLUSIVE OF ALL OTHER WARRANTIES, WHETHER EXPRESSED, IMPLIED, OR STATUTORY. P.I. ENGINEERING DOES NOT WARRANT THIS ***X-keys*** PRODUCT FOR FITNESS FOR A PARTICULAR PURPOSE OR MERCHANT-ABILITY. P.I. ENGINEERING AND ITS EMPLOYEES SHALL NOT BE HELD LIABLE FOR ANY CONSEQUENTIAL, INDIRECT, OR INCIDENTAL DAMAGES, EVEN IF ADVISED OF THEIR POSSIBILITY, ARISING OUT OF THE USE OR INABILITY TO USE THIS PRODUCT. SOME STATES DO NOT ALLOW FOR THE EXCLUSION OR LIMITATION OF CERTAIN LIABILITIES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER LEGAL RIGHTS WHICH VARY FROM STATE TO STATE.

In the event that the above limitations are held unenforceable, P.I. Engineering's liability for any damages to you or to any party shall not exceed the purchase price you paid, regardless of the form of any claim.

This limited warranty is valid for and only applies to products purchased and used inside the United States (and its territories) and Canada.

This limited warranty is governed by the laws of the United States of America and the state of Michigan.

Products from P.I. Engineering

www.xkeys.com

X-keys® ***Y-mouse***® ***RailDriver***®

X-keys User-programmable Keyboards

- **58 key Pro**
- **20 key Desktop**
- **16 key Stick**
- **3 lever Foot Peda*l***

X-keys Custom Programmable Input Devices

- **X-keys Switch Interface**
- **X-keys Controller (with integrated precision joystick)**
- **X-keys Editor (with jog & shuttle control)**
- **Custom/OEM Products**

Y-mouse Splitters & Adapters

- **Y-mouse Dual Mouse Adapter**
- **Y-key key Dual Keyboard Adapter**
- **Y-mouse Keyboard and Mouse Adapter for USB**
- **Y-see two Video Splitter**

Accessories for *X-keys* and *Y-mouse*

- **Double and Large, Square Keys**
- **PS/2 and VGA Extension Cables**
- **Specialty Switches**
- **Connection Adapters**

RailDriver Train Cab Controllers and Modules

- **Desktop Train Cab Controller**
- **Analog Add On Control Module**
- **DCC Add On Control Module**

RailDriver Cyclopedias on CD ROM

- **1922 Locomotive Cyclopedia**
- **1922 Car Builders Cyclopedia**
- **1921 Maintenance of Way Cyclopedia**

How to Find Us

Address:	101 Innovation Parkway Williamston, MI 48895 U.S.A.
Telephone:	517/655-5523 • 800/628-3185
Fax:	517/655-4926
Web:	www.ymouse.com or www.xkeys.com
E-mail:	Sales Department ➢ info@ymouse.com Technical Support ➢ tech@ymouse.com