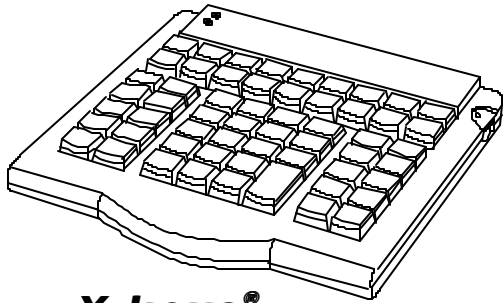
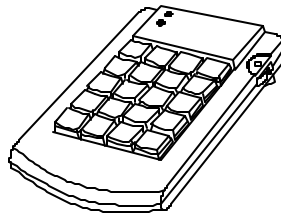


# **X-keys<sup>®</sup>**

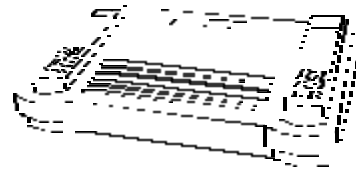
PS/2 Programmable Keyboards by  
**P.I. Engineering, Inc.**



**X-keys<sup>®</sup>  
Pro**



**X-keys<sup>®</sup>  
Desktop**



**X-keys<sup>®</sup> Foot  
Pedal**

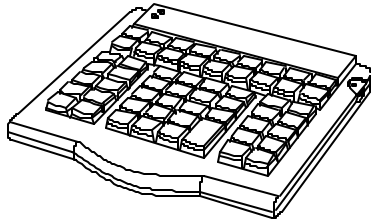
## ***Product Manual***

P.I. Engineering, Inc.  
101 Innovation Parkway  
Williamston, Michigan 48895-1663

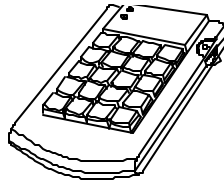
517•655•5523  
FAX 517•655•4926  
e-mail: [info@ymouse.com](mailto:info@ymouse.com)  
[www.xkeys.com](http://www.xkeys.com)

  
**ENGINEERING**  
**PI**  
*"The No Slogan Company"*

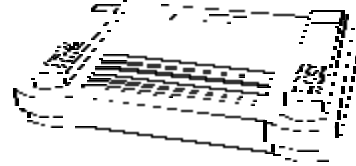
## **X-keys<sup>®</sup> Programmable Keyboards**



**X-keys Pro**  
(58 keys)



**X-keys Desktop**  
(20 keys)



**X-keys Foot Pedal**  
(3 keys)

*X-keys Pro*, *X-keys Desktop*, and *X-keys Foot Pedal* are fully programmable keyboards. Each key on the *X-keys* accepts multiple keystrokes and/or key combinations. This makes *X-keys* easy to customize for a dedicated application or for multiple programs and/or platforms. A single switch allows the user to program each key independently. In addition, the board supports two layers of commands, which means that two sets of keystrokes can be assigned to each key (almost doubling the number of programmable keys).

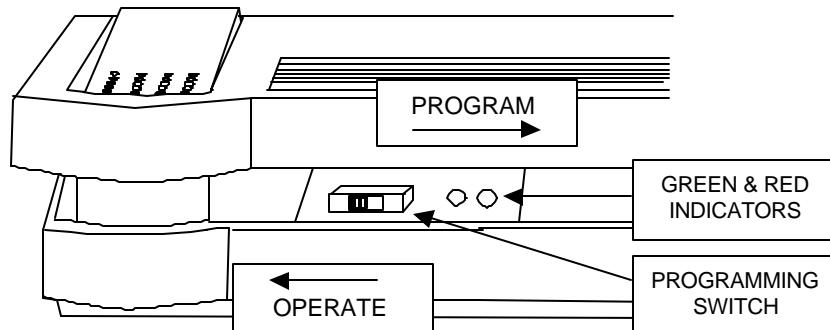
*X-keys* are easy to program, and they work alongside standard keyboards or as standalone bootable keyboards. In other words, both the *X-keys* and the standard keyboard can send keyboard codes to the computer, or the *X-keys* can operate as the only keyboard attached to the computer. If both keyboards are used, switching between the devices is instantaneous because of *Y-mouse<sup>®</sup>* technology that makes the switching operation invisible to the user.

### **Installing the X-keys Programmable Keyboard**

1. Turn off the computer
2. Make the *X-keys* compatible with your keyboard port by attaching the keyboard connector to one of the ends of the *X-keys* cord. Use the large 5-pin or a small 6-pin PS/2 connector, whichever works for your computer.
3. Plug the *X-keys* connector (the end with the pins) into the keyboard port on the computer.
4. Plug the standard keyboard into the other end of the *X-keys* cord.

**NOTE:** The standard keyboard is not required for the *X-keys* to operate, but it is required for programming the *X-keys*.

5. Turn on the computer and make sure the standard keyboard operates properly after complete boot-up. On the *X-keys*, check that the green layer indicator is on to confirm proper installation.



**NOTE:** The programming switch and layer indicators on the *X-keys Foot Pedal* are located under the middle pedal (to prevent the user from accidentally activating programming mode). To change to programming mode, lift the middle pedal from the front, find the switch (about 1" left of center) and, using a non-metallic instrument like a popsicle stick (not included), slide the switch to the right.

## Programming the *X-keys*

**NOTE:** Basic programming instructions are on the back of the *X-keys*.

1. In order to program the *X-keys* the standard keyboard must be attached to the computer along with the *X-keys*, so, install the *X-keys* between the computer and the standard keyboard as described in the installation instructions above. 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 (on an *X-keys Pro* or *X-keys Desktop* a red dot will be visible to the left of the switch). The green or red layer indicator on the *X-keys* will blink, to let you know which layer you are programming.

**NOTE:** The layer indicator has three basic patterns: steady glow indicates operating mode, slow blink indicates programming mode, and double-blink indicates you are programming a selected key.

4. Tap the key on the *X-keys* that you want to program.
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 you are finished typing, tap the key on the *X-keys* again.
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.

**NOTE:** If the keystrokes you are programming are case sensitive (such as names & addresses), see the **Caps Lock Special Features** section on page 6.

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

**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.

## 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 a Layer-toggle Key:*

To switch to another layer one key must be a dedicated layer-toggle key. This may be any key, but program it *before* programming the second layer. To program a layer toggle 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 on the standard keyboard.
4. Tap the <2> key (above the Q) on the alphanumeric section of the standard keyboard.
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.

### *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. 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*, 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 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 (above the Tab key) on the alphanumeric section of the standard keyboard.
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.

### *Programming Repeating keys:*

Keys in 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 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 <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 green (or red) 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 green layer indicator will blink.
2. Tap the key that you want to program. The green 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 green (or red) 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.

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. 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 at this point.

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 green (or red) layer indicator on the **X-keys** will change back to blinking.
9. Slide the programming switch back to the operating position.

### *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 green (or red) layer indicator will blink.
2. Tap the key that 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 X-keys 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 for the professional user 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 green layer indicator will blink.
2. Tap any key on the *X-keys*. The green 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 green (or red) 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 affect 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 green (or red) 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 Caps Lock/Unlock 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 X-keys:*

To erase the entire *X-keys* on a Macintosh computer, tap any key plugged into the *X-keys* when the unit is in programming mode and type, <Esc> <delete> <Esc> <Esc> <Esc> on the standard keyboard. To erase the entire unit on a PC, tap any key in the *X-keys* when the unit is in programming mode and type, <Esc> <Backspace> <Esc> <Esc> <Esc> on the standard keyboard. Resetting the *X-keys* removes all programming from all keys on both layers and returns the *X-keys* to a completely un-programmed state.

### *Programming Errors:*

1. If the *X-keys* encounters programming errors, the red and green layer indicators will blink simultaneously on and off. Turn the programming switch off and back on to reset the *X-keys* to programming mode.
2. 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 commands (for example, pressing <Ctrl>, <Alt> and <Delete> may cause a PC to reboot and the *X-keys* will not boot-up in programming 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.

## **Special Programming Features Table**

Once you become 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
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	Ⓜ<Esc> Ⓜ<Backspace> Ⓜ<Esc> Ⓜ<Esc> Ⓜ<Esc>

### Horizontal and Vertical Double-keys:

Horizontal and/or vertical double-keys can replace two single keys on the *X-keys Pro* and/or *X-keys Desktop*. 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. Various assortments of horizontal, vertical and large square replacement keys are available from P.I. Engineering.

### 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 1/2" x 1/2" 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."

## Box Contents

- **X-keys Pro** or **X-keys Desktop** or **X-keys Foot Pedal**
- Two vertical double-keys\*
- One horizontal double-key\*
- One key-puller\*
- One keyboard connector
- Instruction manual and (for some versions) a CD-ROM

## Additional Accessories\*\*

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

**\*Not included with X-keys Foot Pedal**

**\*\*Available directly from P.I. Engineering (visit: [xkeys.com](http://xkeys.com))**

Electronic design: P.I. Engineering, Inc., Williamston, Michigan

Industrial design: Rienhold Weiss Design, Chicago, Illinois

Patent # 4964075



## 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 MERCHANTABILITY. 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.

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# The P.I. Engineering Line of Input Devices

Visit our web site at [xkeys.com](http://xkeys.com)  
for detailed descriptions of our products

## **Y-mouse® Dual Mouse Adapter:**

- Use 2 mice! Available for serial or PS/2® mouse ports.

## **Y-mouse® Keyboard and Mouse Adapter:**

- Turn your laptop into a desktop with one simple connection.
- Use a PS/2 mouse and keyboard from the same port.
- **Available in both USB and PS/2 versions (for Mac, PC and more!).**

## **Y-key key® Dual Keyboard Adapter:**

- When one keyboard is not enough.
- Great for sharing stations that require keyboard from multiple locations.

## **Y-see two™ Video Splitter:**

- Use two monitors at the same time
- Great for demonstrations, teaching or any situation that requires multiple monitors from the same computer.

## **X-keys® Auxiliary Keyboards:**

- Extra programmable keys that work together with a standard keyboard.
1. Desktop model has 20 keys, Professional model has 58 keys.
- PS/2 and USB versions available.

## **X-keys® Foot Pedal:**

- Use your foot to activate keyboard commands or mouse clicks.
- PS/2 and USB versions available.

## **X-keys® Switch Interface:**

- Use any external switch to activate on screen or standard keyboard and mouse clicks.
- Accepts up to 12 inputs which connect with 1/8" plugs, USB versions only.

## **Custom/OEM Products:**

- PS/2 mouse and keyboard board uses the same chip set as the Y-mouse product line.
- Keyboard matrix control board uses the same chip set as the X-keys product line, PS/2 and USB versions.

## **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](http://www.ymouse.com) or [www.xkeys.com](http://www.xkeys.com)

**E-mail:** Sales Department > [info@ymouse.com](mailto:info@ymouse.com)  
Technical Support > [tech@ymouse.com](mailto:tech@ymouse.com)