



KE18

**PC Keyboard Encoder
User Manual**



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Thank you for purchasing the
HAGSTROM ELECTRONICS, INC.
KE18. This product is configurable in
a variety of ways to meet your specific
requirements. Please take a few minutes to
read this manual before using your KE18.

Introduction to the KE18

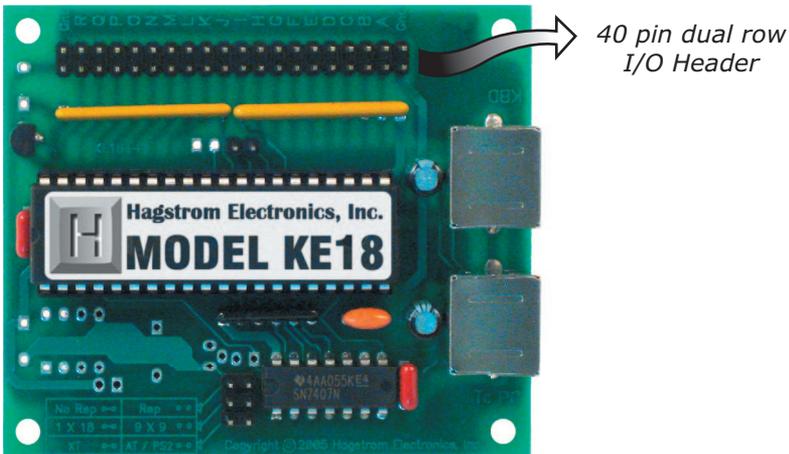
The KE18 PC Keyboard Encoder is a tool for interfacing switches or keypads to your computer's keyboard input. It provides all of the necessary keyboard communication to your computer, and can therefore take the place of the keyboard. The KE18 also features a pass through port for the user's PC keyboard, allowing both the KE18 and the keyboard to be used together. This feature facilitates development and testing of KE18 applications.

Power for the KE18 is obtained from the computer's keyboard connector. No external power supply is required.

The unit may be configured for use with compatible Pentium, PS/2, X86, and PC XT computers.

The 18 pins labeled "A"-"R" on the I/O header provide a means for converting switch closures to keystrokes sent directly to the computer. These I/O pins are jumper configurable for operation as 18 individual inputs, or as a 9x9 matrix. As a switch closure is detected, a code is sent to your computer which corresponds to the input detected (see keycode lookup tables on page 6).

The 40 pin dual row header serves as the connection point to each of the I/O pins on the KE18. This header accepts a variety of connectors, including the plug on many off the shelf keypads. This header also provides a convenient place for attachment of individual switches.



Configuring the KE18 Jumpers

The KE18 is designed to be easy to use. There are 3 jumpers located on the board which allow for selection of various modes. These jumpers must be set before using the product.

Jumper 1

This jumper selects the repeat function of the inputs on the KE18's I/O header.

With this jumper in place, inputs will send a single keystroke to the PC when activated regardless of the length of time they are held on.

When this jumper is open, inputs on the KE18's I/O header will repeat their defined keystroke for the duration the input is held active or until another input is activated.

Jumper 2

This jumper controls the scanning mode for the I/O header on the KE18.

If this jumper is in place, the KE18 will scan the I/O header as 18 individual inputs (pins "A" through "R"). Keystrokes to the PC are activated in the 18 input mode by making a connection between an input pin and one of the logic ground pins ("Gnd"), provided at each end of the I/O header.

With this jumper open, the KE18 scans the I/O header as a 9 Column by 9 Row matrix. In this mode, keystrokes to the PC are generated by connecting a switch such that one Row pin ("J" through "R") and one Column pin ("A" through "I") are shorted together when the switch is activated.

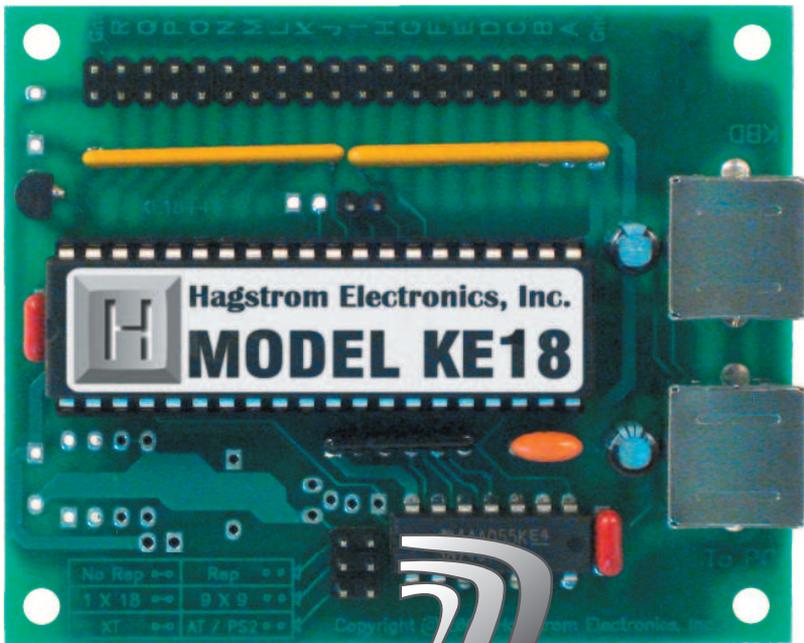
NOTE: See the Keycode Lookup Tables on page 6 for keystrokes available in each of these modes.

Jumper 3

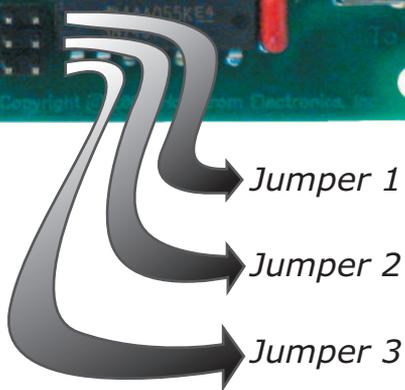
Use this jumper to select the type of PC with which the KE18 will be used.

With this jumper removed (the most commonly used setting), the KE18 operates in the PS/2 "AT" mode, compatible with Pentium and X86 computers.

When this jumper is in place, the KE18 will operate as a PCXT type keyboard. This mode allows for compatibility with early PCs and PCXT based single board computers.



NOTE: The jumpers must be set before power is applied. Changing the jumper settings with power on will have no effect on the options.

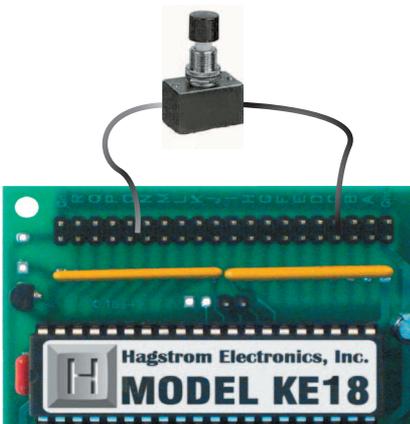
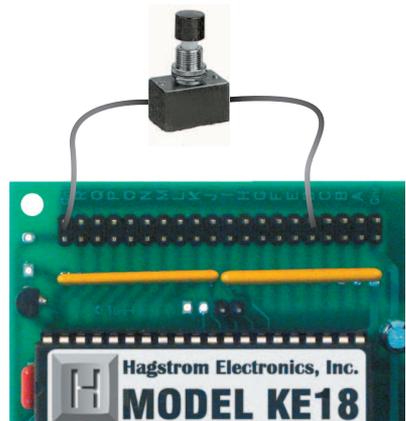


Interfacing to the KE18 I/O Header

Interface of the KE18 to switches and keypads is accomplished by connection to the 40 pin dual row I/O header. Each of the pins of the header is connected in parallel with the adjacent pin. This provides 20 individual interface signals, with both the end pins being logic Ground. The 18 connections are marked “A”-“R” are the KE18 inputs.

18 Input Mode

In the connection of a switch in the 18 input mode, inputs are activated by shorting them to Ground (reference marked “Gnd”). The example shows one side of the switch is connected to input pin “D” and the other is connected to Ground (“Gnd”), producing the keystroke “E” when activated (see KE18 keycode lookup table on page 6). There are 18 individual inputs in this mode.



9x9 Matrix Mode

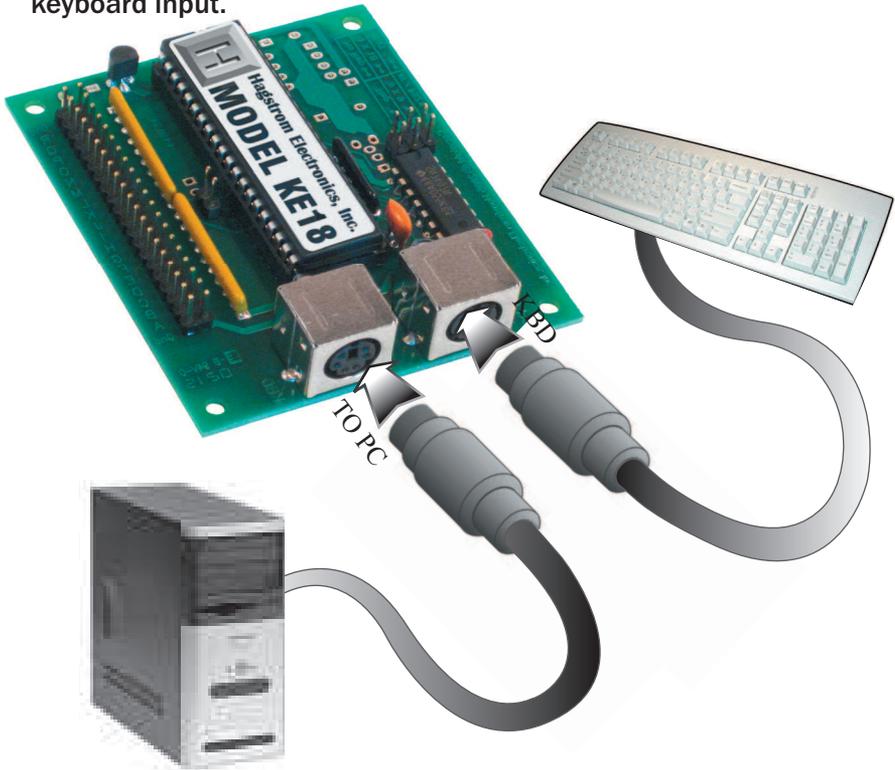
In the 9x9 matrix mode, inputs are activated by shorting a Column pin (“A” to “I”) to a Row pin (“J” to “R”). The example shows input pin “C” which is a Column, and input pin “O” which is a Row, producing the keystroke “X” when activated (see KE18 keycode lookup table on page 6). A total of 81 inputs are available in this mode.

NOTE: KE18 inputs are for “Dry” contacts only! Never connect any signal on the KE18 to an external voltage. TTL/CMOS levels and analog switches are acceptable.

Connection to Computer and Keyboard

There are two miniDIN connectors on your KE18. Each of these connectors has a different function.

The DIN connector which is marked “To PC” is for interface of the KE18 to the computer. Insert one end of a (male to male) shielded cable into this port. The other end of the cable connects to the computer’s keyboard input.



The DIN connector marked “KBD” is for using an external keyboard with the KE18. Plug the keyboard into this port to use it in addition to the KE18. Use of the keyboard is optional; a keyboard does not need to be plugged into this port for the KE18 to operate.

NOTE: Always perform these connections with the computer’s power off.

KE18 Keycode Lookup Tables

The following tables list the keycodes that are sent to the computer by the KE18 in response to activation of an input.

KE18 Keycode Lookup Table (18 Input Mode)

KE18 Header Input Pins

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
A	C	D	E	G	I	L	O	Q	R	S	X	? /	\	F1	Space	Esc	Enter

In this mode, keycodes to the computer are initiated by shorting one input pin to the provided Ground connection. Example: Pin "J" to Ground would produce an "R" on the computer.

KE18 Keycode Lookup Table (9x9 Matrix Mode)

Header Row Pins

		J	K	L	M	N	O	P	Q	R
A	A	B	C	D	E	F	G	H	I	
B	J	K	L	M	N	O	P	Q	R	
C	S	T	U	V	W	X	Y	Z	Esc	
D	: ;	" \	> .	< ,	? /	Space	Back-space	{ [}]	
E	Ctrl	Alt	Shift	Insert	Delete	Home	End	Page Up	Page Down	
F	/	*	-	+	F1	F2	F3	F4	F5	
G	8 ↑	9 Pg Up	. Del	Enter	F6	F7	F8	F9	F10	
H	4 ←	5	6 →	7 Home	-	\	Caps Lock	Num Lock	Print Screen	
I	0 Ins	1 End	2 ↓	3 Pg Dn	+ =	~	Tab	Pause	Scroll Lock	

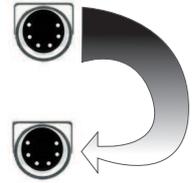
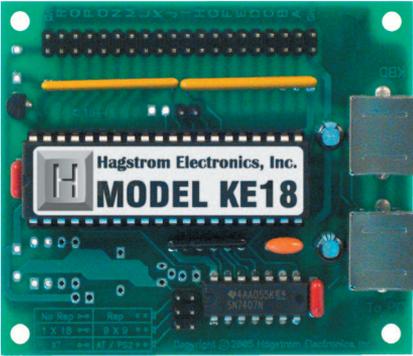
Keycodes to the computer are initiated in this mode by shorting one Row pin to one Column pin. Example: Row "J" to Column "C" would produce an "S" on the computer.

***NOTE** Please contact us for custom keycode information.

Accessories

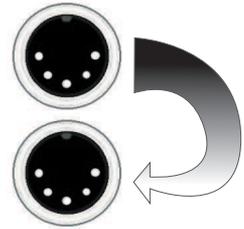
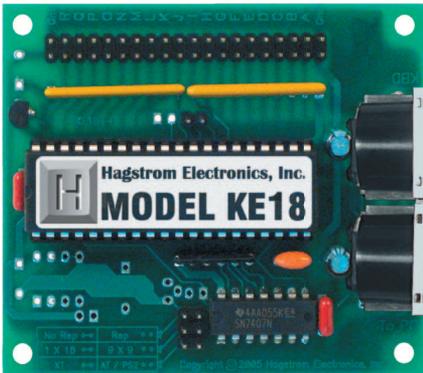
KE-MM6-mini

6 pin miniDIN Male/Male 6 foot cable. Connects KE18 with 6 pin miniDIN connectors to computer.

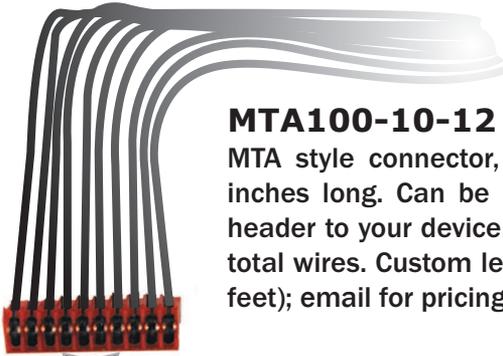


KE-MM6

5 pin DIN Male/Male 6 foot cable. Connects KE18 with 5 pin DIN connectors to computer.

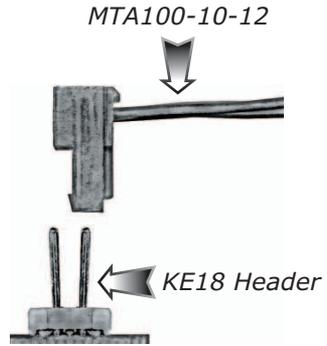
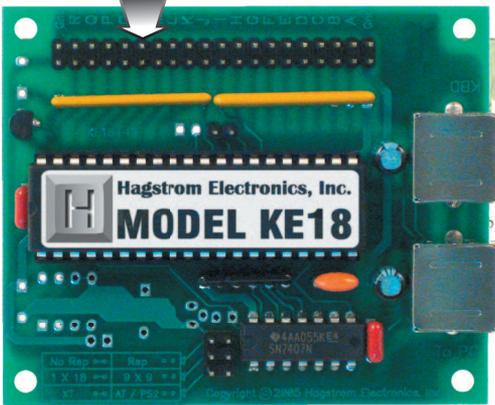


Accessories



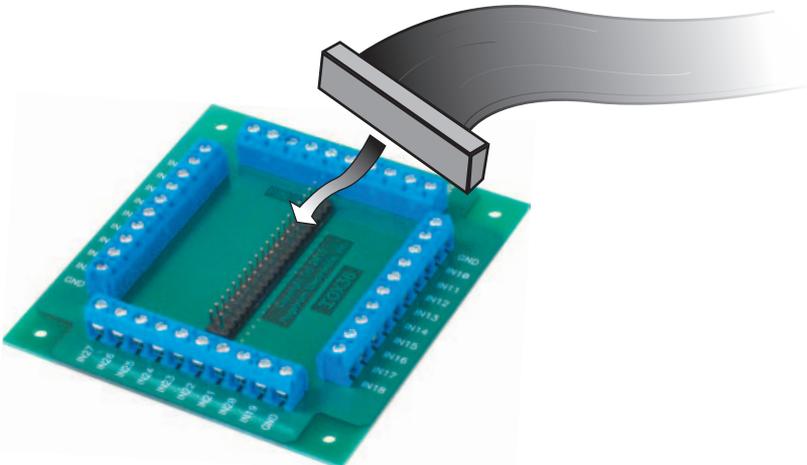
MTA100-10-12

MTA style connector, 10 individual wires, 12 inches long. Can be used to connect the I/O header to your device. Sold as a set of two; 20 total wires. Custom lengths available (up to 10 feet); email for pricing.



IOX36-KE18

Screw terminal block can be used to easily connect your device to the KE18. 40 pin IDE ribbon cable included.



Warranty

HAGSTROM ELECTRONICS, INC. warrants this product against defects in material or workmanship for a period of ONE YEAR from the original purchase date. We will repair or replace (at our option) the returned defective unit at no charge during this warranty period.

No responsibility is assumed for any special, incidental, or consequential damage resulting from the use of or inability to use this product. In no case is **HAGSTROM ELECTRONICS, INC.** to be liable for any amount which exceeds the purchase price of the unit, regardless of the claim.

No other warranty, written or verbal, is authorized. This warranty is applicable only to units sold in the United States. Units sold outside the United States are covered by a similar warranty.

Depending on the state in which you live, you may have additional rights.

Great care has been taken during the assembly, testing, and burn-in of your KE18 to ensure its performance. If you have any questions, please send us an email.

customer service email: [**sales@hagstromelectronics.com**](mailto:sales@hagstromelectronics.com)

NOTICE The KE18 product is designed to be used by technically oriented computer users. When the KE18 is in use, your computer's signals and voltages are present on the unit. Prudent handling and packaging is necessary to prevent damage to your computer.



HAGSTROM
ELECTRONICS, INC.

sales@hagstromelectronics.com
www.hagstromelectronics.com

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