The JK microsystems matrix keypad driver provides you with an easy means of scanning an up to 8x8 matrix of keyswitches or pushbuttons. Each keypress transmits a programmer-defined character to DOS or the current application with no interference to the existing serial console input.

Software configuration

The matrix keypad driver source file KEYPADEX.ASM must be configured before installation. You will need a text editor, MASM 5.1 equivalent assembler and linker, and an .EXE to .COM converter such as EXE2BIN or EXE2COM.

The first task in configuring the keypad driver is to set the number of rows and columns used by the keypad. The number of rows scanned must be correct since scanning a non-existent row may indicate a keypress in that row and thus prevent the scanning of the rest of the matrix.

Open the file KEYPADEX.ASM in a text editor and go to the data area. Modify the equates rows and columns to accurately reflect the number of rows and columns on your keypad. Valid values are from 1 to 8.
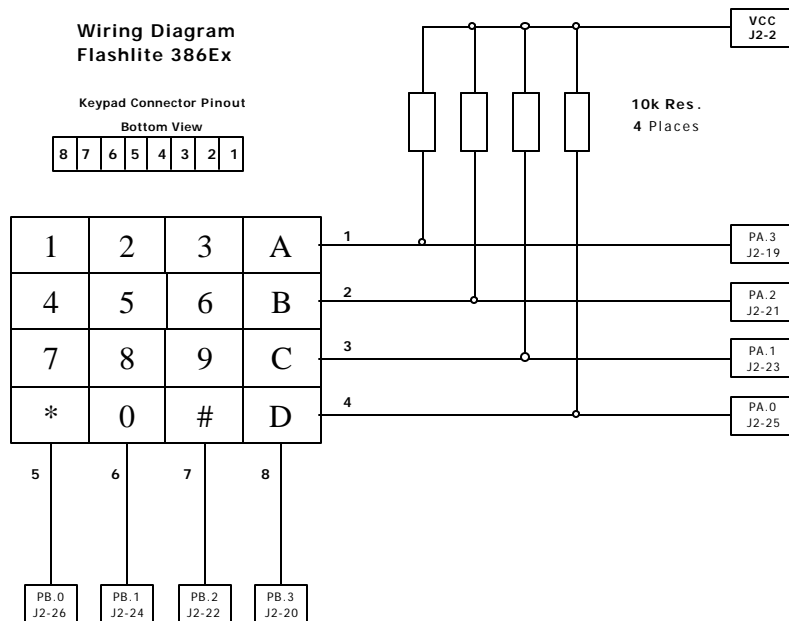
Next edit the keymap to properly reflect the characters you wish to send. Row 1, column 1 is an upper case A in the release software. Here is the default keymap used in KEYPADEX.ASM:

	Col 1	Col 2	Col 3	Col 4
Row 4	1	2	3	A
Row 3	4	5	6	B
Row 2	7	8	9	C
Row 1	∗	0	#	D

You may specify up to 8 rows and 8 columns. Unused rows require a db 0 directive as a placeholder. After you have modified the keymap to suit your needs, close the file, reassemble, relink and convert the .EXE file to a .COM file. Upload KEYPADEX.COM to the Flashlite.

Hardware configuration

The keypad is connected to the Flashlite 386Ex ports PA and PB. PB.0 to PB.7 are used as column scanning outputs for columns 1 to 7. PA.0 to PA.7 are used for row inputs 1 to 7. Each active row input must have a pullup resistor to Vcc. The resistor value is not critical, 10k ohms is fine. The following diagram shows the connections for a 4x4 keypad:

Wiring Diagram
Flashlite 386Ex

Keypad Connector Pinout
Bottom View

8	7	6	5	4	3	2	1

1	2	3	A
4	5	6	B
7	8	9	C
*	0	#	D

VCC
J2-2

10k Res.
4 Places

1 — PA.3 J2-19
2 — PA.2 J2-21
3 — PA.1 J2-23
4 — PA.0 J2-25

5 — PB.0 J2-26
6 — PB.1 J2-24
7 — PB.2 J2-22
8 — PB.3 J2-20

Final configuration and test

Connect the keypad to J2 and power up the Flashlite. Run the keypad driver. You should get a DOS prompt after the driver loads. Press the keypad keys. You should see the proper characters appear on the console screen. Modify the STARTUP.BAT file to load the keypad driver at power up or reset.

Generating multiple characters per keypress

It is possible to load more than one copy of the keypad driver in order to generate multiple characters per keypress. Create a uniquely named copy of the driver for each keypress, with the keymap of each driver edited for each of the successive characters in the string. Load the drivers in reverse order of which the characters should be displayed. (The last driver loaded is the first in the chain) This technique should be limited to 2 or 3 characters because of the increased timer tick interrupt latency.

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Software configuration

The matrix keypad driver source file KEYPAD.ASM must be configured before installation. You will need a text editor, MASM 5.1 equivalent assembler and linker, and an .EXE to .COM converter such as EXE2BIN or EXE2COM.

The first task in configuring the keypad driver is to set the number of rows and columns used by the keypad. The number of rows scanned must be correct since scanning a non-existent row may indicate a keypress in that row and thus prevent the scanning of the rest of the matrix.

Open the file KEYPAD.ASM in a text editor and go to the data area. Modify the equates rows and columns to accurately reflect the number of rows and columns on your keypad. Valid values are from 1 to 8.
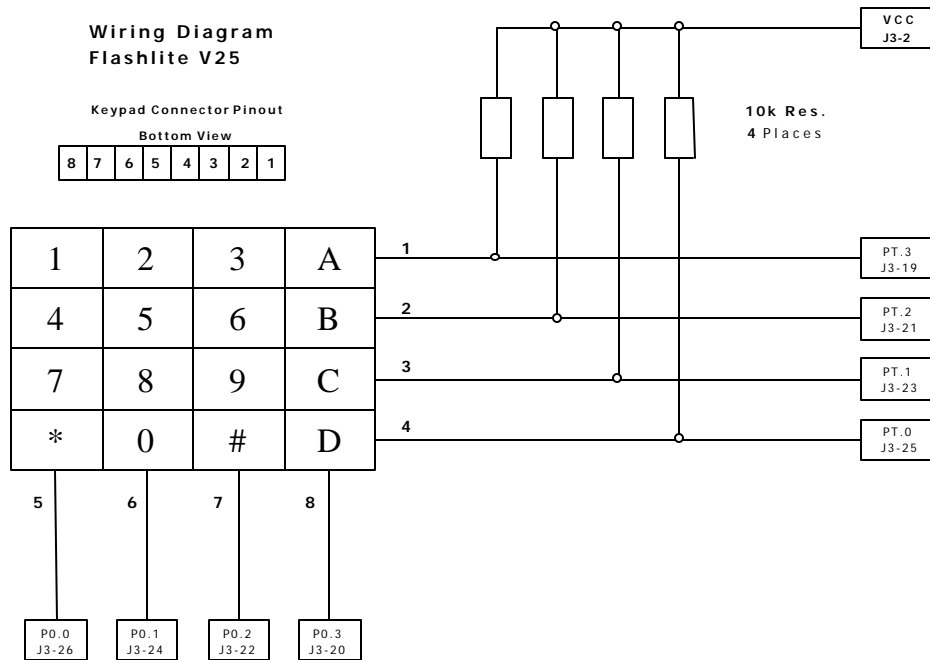
Next edit the keymap to properly reflect the characters you wish to send. Row 1, column 1 is an upper case A in the release software. Here is the default keymap used in KEYPAD.ASM:

	Col 1	Col 2	Col 3	Col 4
Row 4	1	2	3	A
Row 3	4	5	6	B
Row 2	7	8	9	C
Row 1	*	0	#	D

You may specify up to 8 rows and 8 columns. Unused rows require a db 0 directive as a placeholder. After you have modified the keymap to suit your needs, close the file, reassemble, relink and convert the .EXE file to a .COM file. Upload KEYPAD.COM to the Flashlite.

Hardware configuration

The keypad is connected to the Flashlite V25 ports PT and P0. P0.0 to P0.7
are used as column scanning outputs for columns 1 to 7. PT.0 to PT.7 are used
for row inputs 1 to 7. Each active row input must have a pullup resistor to Vcc.
The resistor value is not critical, 10k ohms is fine. The following diagram shows
the connections for a 4x4 keypad:

Wiring Diagram
Flashlite V25

Keypad Connector Pinout
Bottom View

8	7	6	5	4	3	2	1

VCC
J3-2

10k Res.
4 Places

1	2	3	A
4	5	6	B
7	8	9	C
*	0	#	D

1 — PT.3 J3-19
2 — PT.2 J3-21
3 — PT.1 J3-23
4 — PT.0 J3-25

5 — P0.0 J3-26
6 — P0.1 J3-24
7 — P0.2 J3-22
8 — P0.3 J3-20

Final configuration and test

Connect the keypad to J3 and power up the Flashlite. Run the keypad driver.
You should get a DOS prompt after the driver loads. Press the keypad keys.
You should see the proper characters appear on the console screen. Modify the
STARTUP.BAT file to load the keypad driver at power up or reset.

Generating multiple characters per keypress

It is possible to load more than one copy of the keypad driver in order to generate
multiple characters per keypress. Create a uniquely named copy of the driver for
each keypress, with the keymap of each driver edited for each of the successive
characters in the string. Load the drivers in reverse order of which the characters
should be displayed. (The last driver loaded is the first in the chain) This
technique should be limited to 2 or 3 characters because of the increased timer
tick interrupt latency.