8000-SKM

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United States FCC Part 15, Subpart B, Class A EMI Compliance Statement

Note: This equipment has been tested and found to comply with limits for a Class A 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 commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Warning For European Users

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Electromagnetic Compatibility Warning

The connection of non-shielded equipment interface cables to this equipment will invalidate FCC EMI and European Union EMC compliance and may result in interference and/or susceptibility levels which are in violation of relevant regulations. It is the responsibility of the system integrator and/or user to obtain and use shielded interface cables and equipment used with this device. If this equipment has more than one connector, do not leave cables connected to unused interfaces. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

1. All interface cables must include braid/foil type shields. Communication cable connectors must be metal, ideally zinc die-cast backshell types, and provide 360° protection about the interface wires. The cable shield braid must be terminated directly to the metal connector shell; ground drain wires alone are not adequate.
2. Protective measures for power and interface cables as described within this manual must be applied. Do not leave cables connected to unused interfaces or disconnected at one end. Changes or modifications to this device not expressly approved by the manufacturer could void the user's authority to operate the equipment.

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Chapter 1 – 8000-SKM Overview

Xycom's 8000-SKM module provides a convenient means of connecting up to seven foot or selector switches to a host CPU. It does so through the host CPU keyboard port by simulating a keyboard key press. It also has the ability to merge switch signals with an external keyboard.

8000-SKM Block Diagram

Figure Chapter 1 -1 depicts the 8000-SKM block diagram, to illustrate how the module operates.

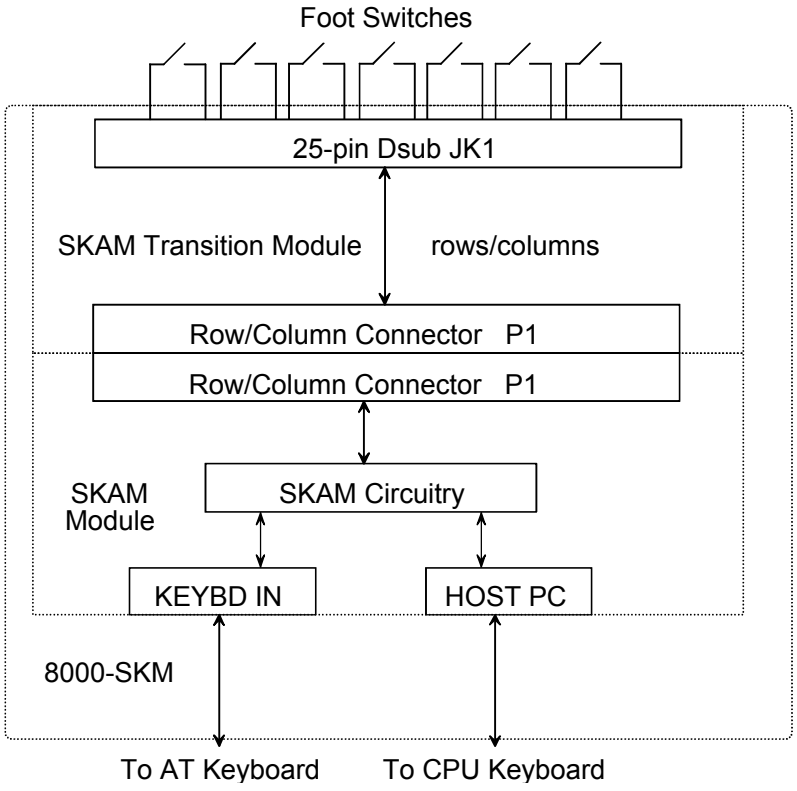

Figure Chapter 1 -1. 8000-SKM Block Diagram

Preprogrammed Key Codes

For your convenience, Xycom has preprogrammed 25-pin connector JK1 with the most commonly used key codes. Table Chapter 1 -1 lists these preprogrammed key codes.

Table Chapter 1 -1. Preprogrammed Key Codes

Pins	Switch	Preprogrammed Key Code
1, 14	SW1	ENTER
2, 15	SW2	F1
3, 16	SW3	Y
4, 17	SW4	=
5, 18	SW5	N
6, 19	SW6	F2
7, 20	SW7	TAB

If desired, the unit may be reprogrammed using the Programmable Keyboard Interface Module (PKIM). See Chapter 3 for more information.

Specifications

Table Chapter 1 -2. Hardware Specifications

Characteristic	Specification
Mechanical	
Height	2 inches (50.8 mm)
Width	6.15 inches (156.2 mm)
Depth	4.75 inches (120.6 mm)
Weight	1 lb. 12 ½ oz. (0.807 Kg)
Electrical	
Voltage	5.25 VDC maximum
Current	0.45 amp maximum
Maximum Cabling Distance	
From 8000-SKM to host PC	6 feet (1.83 m)
From 8000-SKM to foot switch	25 feet (7.62 m)

Table Chapter 1 -3. Environmental Specifications

Characteristic	Specification
Temperature Operating Non-operating	 0º to 50ºC (32º to 122ºF) -40º to 60º C (-40º to 140ºF)
Humidity Operating Non-operating	 20 to 80% RH, non-condensing 20 to 90% RH, non-condensing
Altitude Operating Non-operating	 Sea level to 10,000 feet (3048 m) Sea level to 40,000 feet (12192 m)

Regulatory Compliance

The 8000-SKM complies with the following standards.

UL	UL 1950 (Information Technology Equipment)–pending	
CUL	CSA 22.2, #950 (Information Technology Equipment)–pending	
EU "CE Marking"	EMI	EN 55022, Class A
	Immunity	EN 50082-2: 1995
	Safety	EN 60950
FCC	47 CFR, Part 15, Class A	

Chapter 2 – Installation

This section provides information on how to connect your 8000-SKM module to a host PC, as well as a keyboard.

Connecting the 8000-SKM

Figure Chapter 2 -1 illustrates the 8000-SKM's I/O panel.

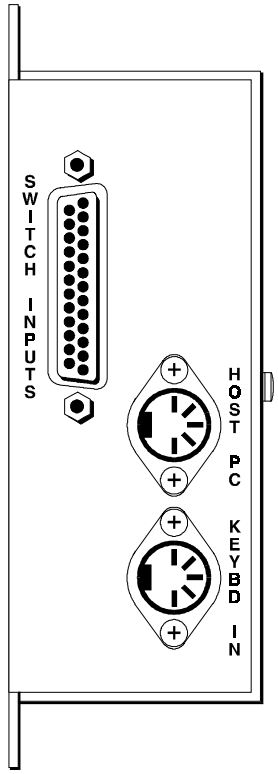

Figure Chapter 2 -1. 8000-SKM I/O Panel

Figure Chapter 2 -2 shows how a keyboard and foot switches connect to an 8000-SKM, and how an 8000-SKM connects to a host computer.

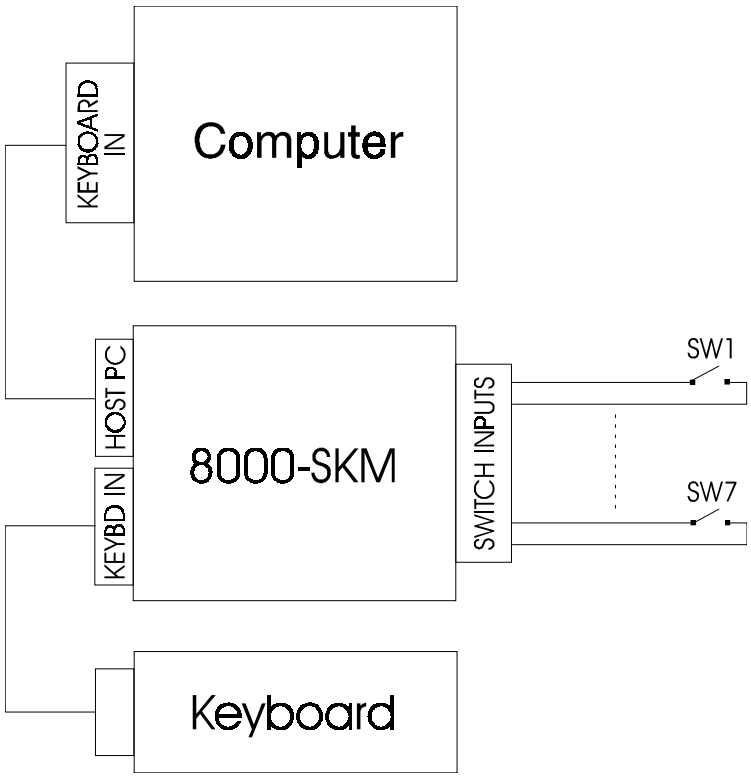

Figure Chapter 2 -2. Connection Diagram

Connecting Switches to the 8000-SKM

A 25-pin Dsub is used to connect to seven foot or selector switches. Use shielded cable to connect switch pairs to a cable such as Belden 1508A. Each switch should have its own shielded cable so you will need a maximum of seven shielded cable pairs (one for each switch). Each shield should be terminated to the DB25 all-metal backshell (such as an AMP 745173-1).

The pinout is shown is Table Chapter 2 -1.

Table Chapter 2 -1. Switch Pinouts

Pins	Switch
1, 14	SW1
2, 15	SW2
3, 16	SW3
4, 17	SW4
5, 18	SW5
6, 19	SW6
7, 20	SW7
8, 9, 10, 11, 12, 13, 21, 22, 23, 24, 25	N/C

Dimensions

Figure Chapter 2 -3 provides a diagram of the 8000-SKM's dimensions for mounting purposes.

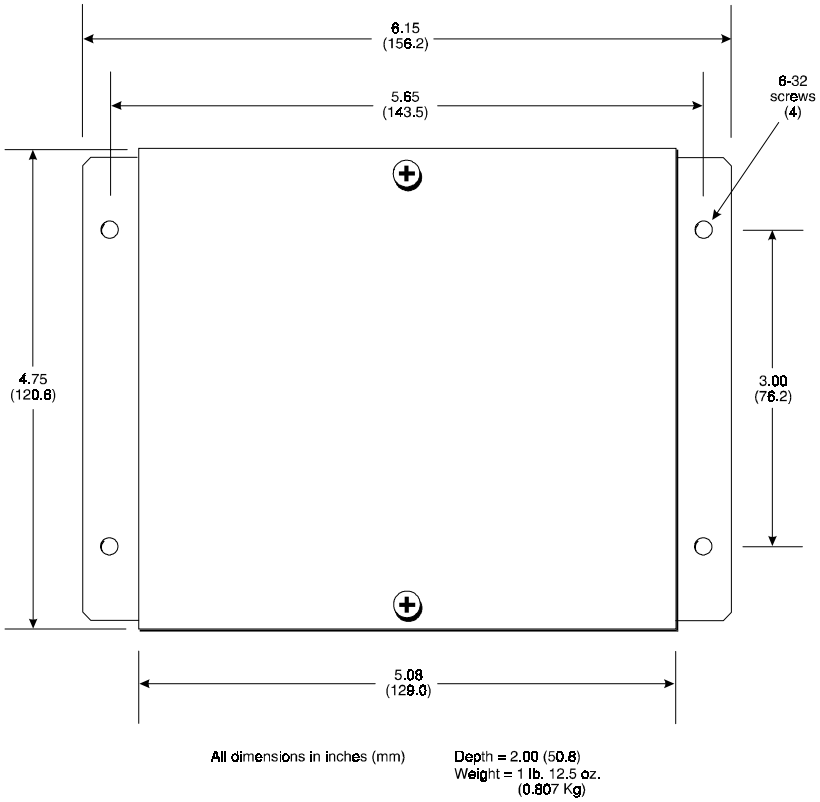

Figure Chapter 2 -3. 8000-SKM Dimensions

Chapter 3 Programmable Keyboard Interface Module Utility

For your convenience, Xycom has preprogrammed 25-pin connector JK1 with the most popular key codes. If you want to reprogram these key codes, you can use Xycom's Programmable Keyboard Interface Module (PKIM) utility. This utility allows you to reprogram the 9450 keypad (which corresponds to the key codes programmed on the 8000-SKM). An external full-stroke PC/AT keyboard is used to access the utility. (This keyboard cannot be redefined.)

Table Chapter 3 -1 lists the predefined key codes.

Table Chapter 3 -1. Preprogrammed Key Codes

Pins	Switch	Preprogrammed Key Code
1, 14	SW1	ENTER
2, 15	SW2	F1
3, 16	SW3	Y
4, 17	SW4	=
5, 18	SW5	N
6, 19	SW6	F2
7, 20	SW7	TAB

When you use the PKIM utility to reprogram key codes, you will view an illustration of the 9450 keypad. This keypad does not indicate switch locations. Figure Chapter 3 -1 is provided to help you locate the switches you want to reprogram on this keypad.

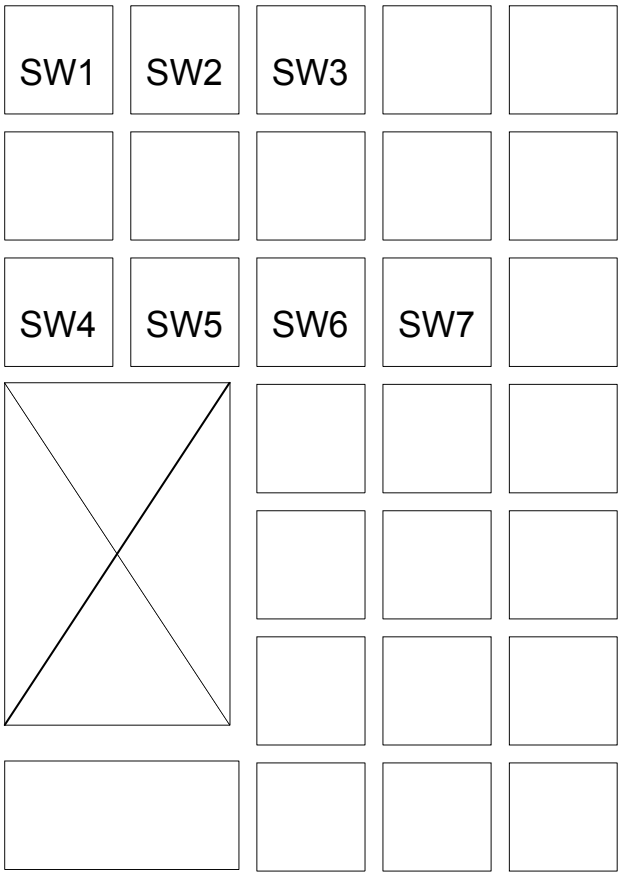

Figure Chapter 3 -1. Switch Locations on 9450 Keypad

You can use the PKIM utility on any desktop PC. However, not all desktop PCs are compatible with the PKIM utility. If your desktop PC is incompatible, contact Xycom Application Engineering for help in reprogramming your key codes.

Loading the PKIM Utility

You can run the PKIM utility from the disk or copy it onto your hard drive. To run the utility from the disk, change the directory to the appropriate drive and type `PKIM`. To load the utility onto your hard drive, create a subdirectory for the files, and copy all the files on the disk into that subdirectory. Enter the subdirectory and type `PKIM`.

Using the PKIM

The PKIM utility uses a menu bar and pull-down menu system. Menu bars display across the top of the screen. “Xycom PKIM Utility” and the current menu title appear at the bottom of the screen.

A full stroke keyboard is needed to enter keystrokes while recording a new switch macro, editing an existing macro, and entering utility commands. All switches on the 8000-SKM can be redefined. While the utility is running, the switches are disabled.

Dialog boxes appear for user prompts and to display error and user advice messages.

Two keys can be used to exit from the menus:

- ESC moves to the previous menu or out of the utility from the Main Menu.
- F1 returns to the current menu headings in some of the menus where Exit can be chosen to exit this menu.

The keys specific to each menu appear at the bottom of each screen.

Startup

This section describes the startup options for the utility.

PKIM `[/r | /t]` runs the full PKIM utility

/r Equals reduced functionality. Some keyboard controllers will not allow the PKIM utility to have control. In this case, key codes uploaded from the EEPROM cannot be translated correctly. Starting the utility with the /r switch removes the Upload option from the Main Menu. In this mode, editing must start with macros read in from a file since they cannot be read from EEPROM.

/t Equals translate. Some systems initialize the keyboard to run in XT mode. In this case, the scan codes read in from the keyboard when in Teach mode will not be correct unless the utility is started with the /t switch.

Utility Batch Mode

Versions 2.2 and above of the utility include a mode for reprogramming switches from a batch file. This feature is useful if you wish to reprogram many units with customized switch macros without having to enter the full PKIM utility for each unit. Once the full utility has been used to create and save switch macros, the files containing these macros can be included on a disk with the PKIM utility and then used to reprogram other units from a batch file.

PKIM filename runs the PKIM utility batch mode where filename is the file containing the new switch macros. The filename extension must be included. For example, `PKIM newdef32.pkm` in a batch file will reprogram the default values for the numeric keys.

You may also specify multiple macro filenames in the PKIM line. For example, `PKIM newdef32.pkm 20funcff.pkm` will reprogram the numeric and function keys.

Main Menu

The Main Menu provides six selections: Exit, Files, Macros, Upload, Download, and Utilities.

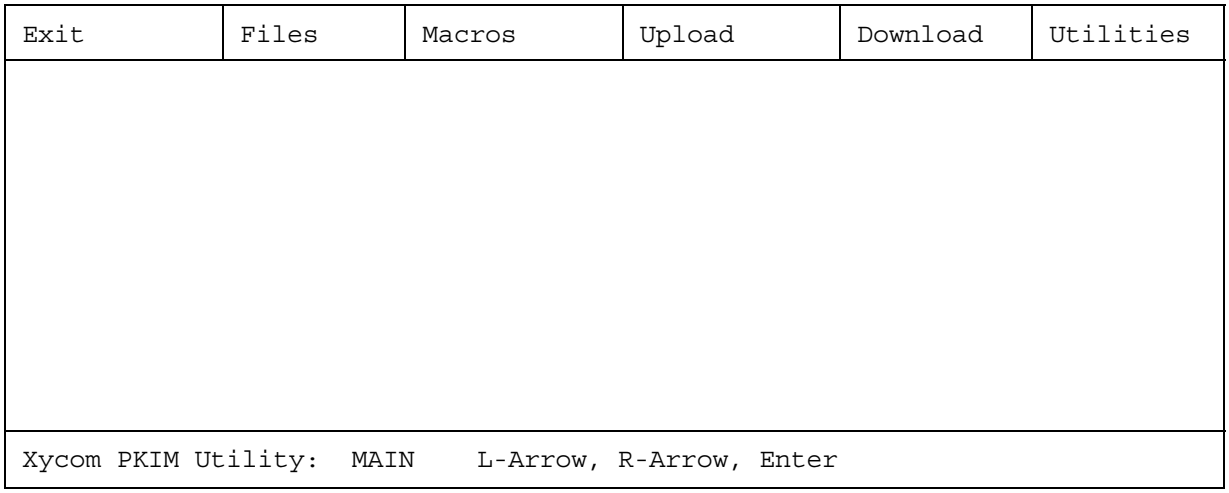

Figure Chapter 3 -2. Main Menu

Exit

Closes open files and exits the utility. ESC can also be used for this purpose, as well as to exit other menus.

Files Menu

Files containing switch macro sets (a macro for each switch) may be saved on disk and loaded into memory to view, edit, or download to the PKIM. Some of these files may be included in the utility package for use in reconfiguring the switches for different software packages and as templates for defining completely new switch macro sets.

When you choose Files, a pull-down menu displays, providing the following choices: Open, Close, Save, Save As, Delete, and Exit.

Open

Opens a file that contains a macro set for one of the switches and loads the contents into memory. Any macro set previously in memory is overwritten. Once loaded, the macro set is available to edit, view, teach, and/or download to the PKIM.

Close

Clears the set of macros from memory and closes the file from which they came.

Save

Copies the set of macros from memory back into their original file. The original file contents are overwritten.

Save As

Creates a new file under the specified name and copies the set of macros from memory into it. For example, to define different sets of codes, save each set under a different name and download the one you wish to use.

Delete

Deletes a file.

Exit

Returns to the Main Menu.

Macros Menu

When you select Macros, a menu bar displays four choices: Exit, View, Teach, and Edit.

> **Note**
>
> You must have a macro file in memory before the Macros Menu is available. To load a macro file, Open or Upload a file.

Exit

Returns to the Main Menu.

View

Allows viewing the macro for the selected switch without worrying about an accidental change to the macro. When View is chosen, the Exit option and the state of the click (clicks are not supported on the 9450) are displayed on the menu bar and a graphic representation of the chosen switch is shown. Select `Exit` from the View Menu to return to the Macros Menu.

To select a switch to view, use the arrow keys to position the cursor on the desired switch and press ENTER.

The macro is displayed as two lines–ASCII and code. The ASCII line displays each key code as the key it represents on the full stroke keyboard. Special labels are used for certain keys (e.g., Spc for space bar, UAr for up arrow, and bk for the break code prefix).

The code line is displayed in either Hex or decimal, as explained below. There is a one-to-one correspondence between the ASCII and code lines to help interpret the code line.

The menu bar displayed while viewing the macro offers two options: Exit and Hex/Decimal.

Exit

Returns to the View menu.

Hex/Decimal

Toggles between displaying the macro in hex or decimal format. The default is Hex. When Hex is chosen, key codes are displayed as they are in memory, as hexadecimal value scan codes. When Decimal is chosen, key codes are displayed as the decimal equivalent of the hex codes.

For example, the macro *abc* would be displayed as 1C F0 1C 32 F0 32 21 F0 21 in hex, and 28 240 28 50 240 50 33 240 33 in decimal.

Teach

Allows you to record up to 105 keystrokes in a macro. When Teach is selected, a graphic representation of the keypad currently in memory is displayed. Menu bar choices are Exit, ASCII/Hex/Decimal, and Click ON/OFF.

Exit

Returns to the Macros Menu.

ASCII/Hex/Decimal

Chooses the format to display the keystrokes as they are entered. ASCII is the default.

Click

Not supported on the 9450.

ON/OFF

To select a switch to define, use the arrow keys to position the cursor on the desired switch and press ENTER. After a switch is selected, the utility records every keystroke on the external full stroke keyboard in a macro to be assigned to the chosen switch. As the keystrokes are entered, they are displayed using the chosen format. ESC is used to stop recording and return to the Teach Menu, so it cannot be recorded. However, ESC can be included in a macro by using the editor.

Note

The changes made to macros in the Teach Menu are not programmed until you select Download.

Edit

Displays a graphic representation of the keypad in memory and a menu bar displaying Exit, Click, and ON/OFF.

Exit

Returns to the Macros Menu.

Click

Not supported on the 9450.

ON/OFF

To select a switch to edit, use the arrow keys to position the cursor on the desired switch and press ENTER.

In edit mode, the macro is displayed as two lines. The top line (the edit line) displays the macro in either hex or decimal format and is the line in which the actual editing takes place. The bottom line (the ASCII line) displays the macro in ASCII format and is not user configurable. This line helps keep track of which part of the macro you are editing, and will be updated by the utility as editing takes place.

For example:

edit line->	12	75	F0	75	F0	12	1C	F0	1C	12	22	F0	22	F0	12	0
ASCII line->	sh	8	bk	8	bk	sh	a	bk	a	sh	X	bk	X	bk	sh	EOM

The insert, delete, and cursor control keys are active for editing.

When a switch is selected, the menu bar displays the following choices: Exit, Cut, Copy, Paste, Codes, Hex/Decimal, and I/O (Insert/Overtype). The macro for the chosen key is also displayed.

Cut

Deletes a sequence of scan codes from the macro. To select a section to cut:

1. Place the cursor on the first character to cut.
2. Press F1 and select `Cut`.
3. Press ENTER. Cut should still be highlighted, but the cursor will appear on the Edit line. Place the cursor on the last character to cut and press ENTER.

4. The last character of every macro is the end of the macro (EOM) and cannot be deleted.

Copy

Copies a sequence of scan codes from the macro into memory. To select the section to copy:

1. Place the cursor on the first character to copy. Press F1 and select Copy.
2. Press ENTER. Copy should still be highlighted, but the cursor will appear on the Edit line.
3. Place the cursor on the last character to copy and press ENTER.

The copied item does not appear on the screen until you select Paste.

Paste

Inserts a sequence of scan codes (which were saved in memory using Copy) into the macro. To paste a sequence of scan codes that were previously copied, position the cursor where you want the text to appear and then press F1. Select Paste and then press ENTER.

Codes

Displays a table of keys and their scan codes in Hex. See Codes section in this chapter for a complete code listing.

Hex/Decimal

Toggles between displaying the scan codes in Hex and Decimal formats.

Insert

The insert key toggles between insert and overtype mode.

Upload Menu

Use the Upload Menu to choose which switch macro information to load. Choices in this menu are Function keypad, Numeric keypad, Keyboard, PKIM version, and Exit.

Function Keypad

Commands the PKIM to send its entire macro set for the function keys.

Numeric Keypad

Commands the PKIM to send its entire macro set for the numeric keys.

Keyboard

Commands the PKIM to send its entire macro set for the switch array keyboard. (The 9450 does not support the ability to reprogram switch array keyboards. You may choose to upload a keyboard, but the keys will not be defined.)

PKIM Version

Commands the PKIM to send its firmware revision number.

Exit

Returns to the Main Menu.

Note

Only one macro set may reside in memory at one time. Also, Upload is not available if the utility is started with the /r switch

A checksum will be calculated during transmission and an error message displays if an error occurs.

Download Menu

Note

Any macro set previously programmed is overwritten when you select Download.

Download sends the set of switch macros to the PKIM. The macro set must reside in memory before it can be downloaded. A checksum is calculated during transmission and an error message displays if an error occurs.

As the macro is sent, PKIM programs its EEPROM with the new macros which become the new key definitions for the selected switches.

Utilities Menu

When you select Utilities, a menu bar displays four choices: Func Lock ON, Func Lock OFF, Clear EEPROM, and Exit.

Func Lock ON

Turns on the function key interlock feature. The function key interlock disables all function keys as long as one function key is pressed (only one function key can be activated at one time).

Func Lock OFF

Turns off the function key interlock feature, allowing multiple function key presses.

Clear EEPROM

Erases the EEPROM memory. This will clear the entire set of switch macros, and the contrast, backlight timeout, and function key interlock settings. After using this feature, the unit should be turned off and then on. This will initialize the EEPROM with the default settings.

Exit

Returns to the Main Menu.

Codes

Special PKIM codes replace the standard IBM scan codes for 101-key keyboard enhanced keys in macros that use these keys. Table Chapter 3 -2 defines these special scan codes.

Table Chapter 3 -2. Special PKIM Scan Codes

Code	Description
E2	Insert
E3	Home
E4	Page Up
E5	Delete
E6	End
E7	Page Down
E8	Up Arrow
E9	Left Arrow
EA	Right Arrow
EB	Down Arrow
EC	Forward Slash
ED	Print Screens/Sys Rq
EE	Pause/Break

Table Chapter 3 -3 defines the default switch key codes produced by the PKIM utility.

Table Chapter 3 -3. Default Switch Key Codes

Key	Key Code	Key	Key Code
ESC	76H	.	49H
SHIFT	12H	=	55H
CTRL	14H	¬	E0H, 6BH
ALT	11H	-	E0H, 75H
DEL	E0H, 71H	®	E0H, 74H
PG UP	E0H, 7DH	¯	E0H, 72H
HOME	E0H, 6CH	F1	05H
INSRT	E0H, 70H	F2	06H
PAUSE	E1H, 14H, 77H, F0H	F3	04H
+	79H	F4	0CH
PG DN	E0H, 7AH	F5	03H
END	E0H, 69H	F6	0BH
SPACE	29H	F7	83H
BK SP	66H	F8	0AH
-	7BH	F9	01H
7	3DH	F10	09H
8	3EH	F11	12H, 05H
9	46H	F12	12H, 06H
4	25H	F13	12H, 04H
5	2EH	F14	12H, 0CH
6	36H	F15	12H, 03H
1	16H	F16	12H, 0BH
2	1EH	F17	12H, 83H
3	26H	F18	12H, 0AH
ENTER	5AH	F19	12H, 01H
0	45H	F20	12H, 09H