Product Manual
IKB-1000

Industrial Programmable Keyboard for IBM Compatible Computers

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PM-IKB Revision 4

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Section 1: Introduction

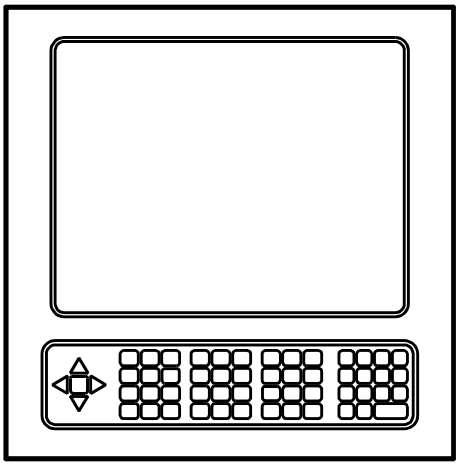
Quartech's IKB-1000 is a family of ruggedly constructed, industrial keyboards. Each member of the IKB family has been designed specifically for use with IBM PS/2, PC/AT, and PC/XT compatible computers. The IKB-1000 plugs directly into the computers keyboard port and does not require any computer resident program to function.

Here are some key features.....

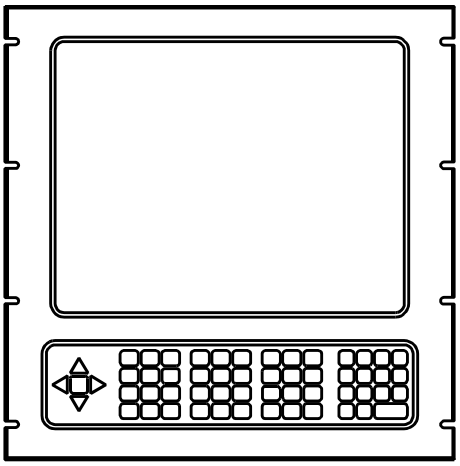
- **Rugged construction:** Built for harsh industrial environments.
- **NEMA 4/12:** Panel mounted version maintains NEMA 4 and NEMA 12 enclosure ratings.
- **Custom key layout:** 36 user defined keys may be programmed to act like almost any key on the standard 101-key keyboard.
- **Macro keys:** Multiple keystroke "macro" strings may be programmed into the user defined keys. Up to 60 keystrokes may be programmed into one key.
- **Auxiliary Keyboard Port:** A standard 101-key keyboard may be plugged into the IKB-1000. The IKB-1000 will pass keys from this auxiliary keyboard on to the host computer.
- **Sealed window:** A NEMA 4/12 sealed window is available to protect your 19" video display.

The keyboard may be mounted on one of three different bezel assemblies, as shown below.

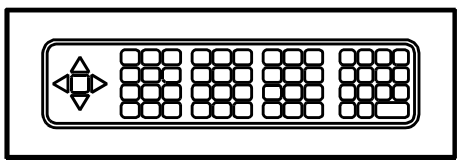
IKB-1011
Panel Mount CRT/Keyboard Bezel



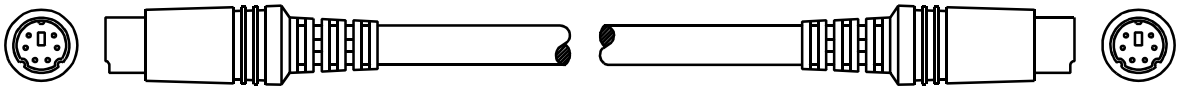
IKB-1021
19" Rack Mount CRT/Keyboard Bezel



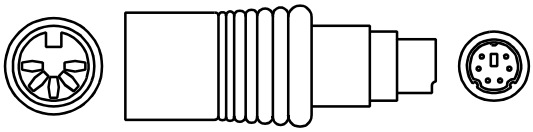
IKB-1041
Panel Mount Keyboard Bezel



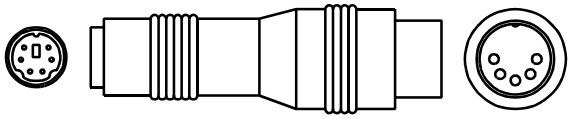
The following accessories are included with each IKB-1000:



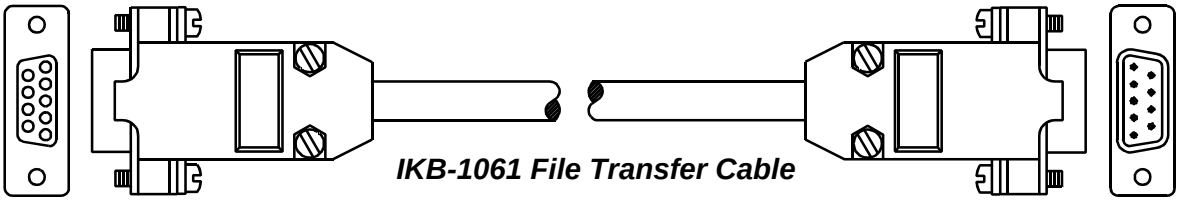
IKB-1063 Interface Cable



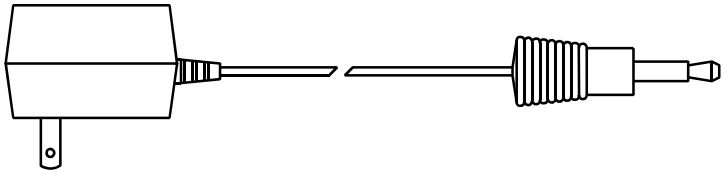
5 Pin DIN to 6 Pin Mini-DIN Adapter



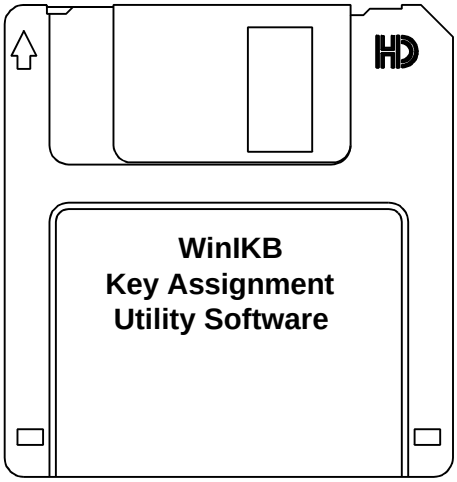
6 Pin Mini-DIN to 5 Pin DIN Adapter



IKB-1061 File Transfer Cable



Programming Power Supply (Wall Transformer)



Each of the 36 user defined keys can be programmed to generate the scan code sequence of almost any key on the 101 key keyboard. Also, each of the keys may be programmed as a macro. A macro key allows you to program a number of keystrokes into one key. When the operator presses a macro key, the IKB-1000 will generate the scan code sequence of each key that was programmed into the macro string. A simple software utility allows the user to create a file defining each key. The file can then be sent to the IKB-1000 via the computer's serial communication port. Since the IKB-1000 stores the data file in nonvolatile memory (EEPROM), you only have to program it once, but you can change the program as often as needed.

An auxiliary keyboard port is provided that allows an external keyboard to be active at the same time as the IKB-1000. The IKB-1000 will accept input at the auxiliary keyboard port and pass these key codes through to the host computer. In this way, the IKB and the external keyboard can be online at the same time.

WinIKB Key Assignment Utility

The **WinIKB** Key Assignment Utility is a computer program that allows you to define the scan code sequence that will be transmitted by each of the 36 user defined keys. The **WinIKB** software is only needed to configure the IKB-1000 keyboard. Once this is done, the keyboard is a stand alone device that can be used with any compatible computer. The **WinIKB** software does not need to be installed on the host computer to use the keyboard.

Minimum hardware requirements for the **WinIKB**: IBM PC/AT, PS/2, or 100% compatible computer running under Window 3.1X, 95, 98, or NT with an asynchronous serial communication port.

To start the program, double click on the **WinIKB** Icon in the Quartech Solution Program folder.

The **WinIKB** program's Main Screen will look as follows. (Figure 2.0)

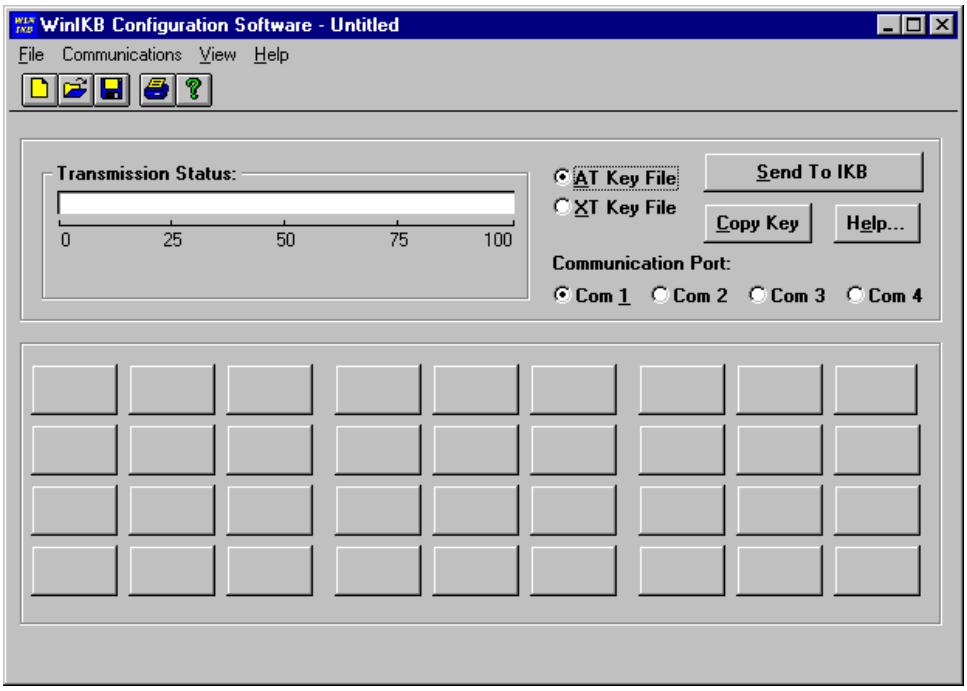


Figure 2.0

2.1 Edit

36 boxes are arranged on the screen to represent the 36 user defined keys provided on the IKB-1000. They are numbered 1-36 from upper left to lower right. Select the key that you wish to edit by placing the cursor over the key and clicking it. A new screen will appear showing you the 60 possible keystrokes that can make up the macro for each of 36 definable keys. (Figure 2.1.0)

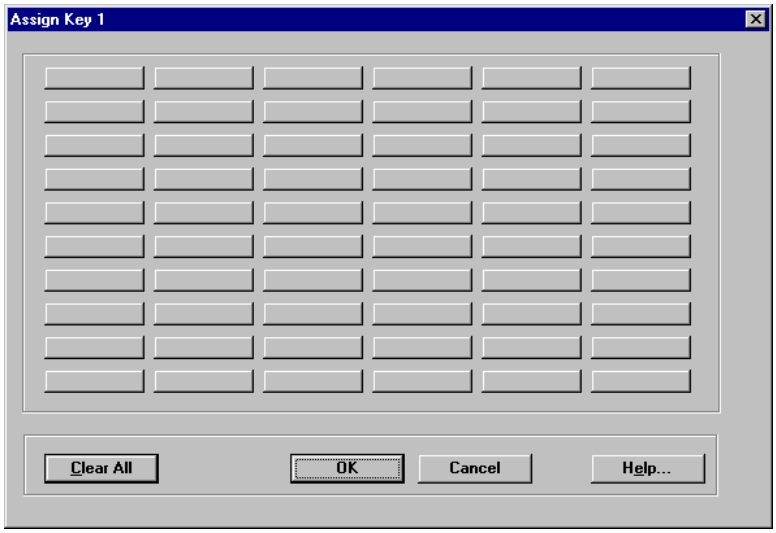


Figure 2.1.0

Note: An individual user-defined key may be assigned up to 60 keystrokes. The total number of keystrokes for all user-defined keys must not exceed 481. An alert will be displayed and the user prevented from exceeding this maximum.

Some keys sequences like [Ctrl]+[c] and [Alt]+[a] use more memory. Therefore, you may not reach the ideal maximum of 60 keys per macro. Once again, an alert will be displayed when the user has reached the maximum memory available for a given macro.

To start the macro build, select the button in the upper left (the buttons are selected left to right top to bottom) and the following display will appear. (Figure 2.1.1)

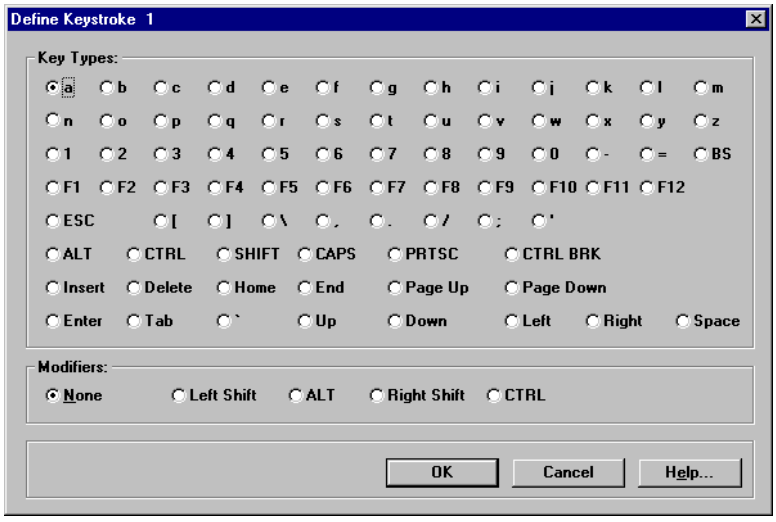


Figure 2.1.1

Using your cursor select the key sequence for keystroke 1. In this example, I will select [Left Shift - A]

which will produce the # sign. (Figure 2.1.2)

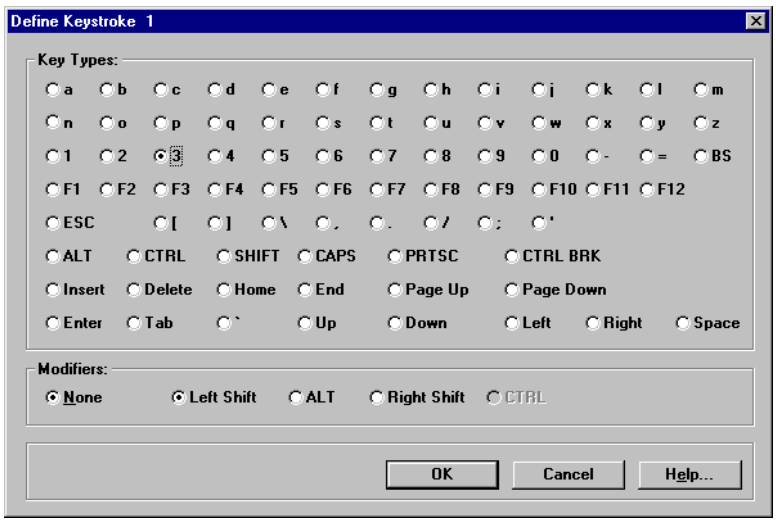


Figure 2.1.2

Pressing the OK button will place this key sequence in to the first position. (Figure 2.1.3)

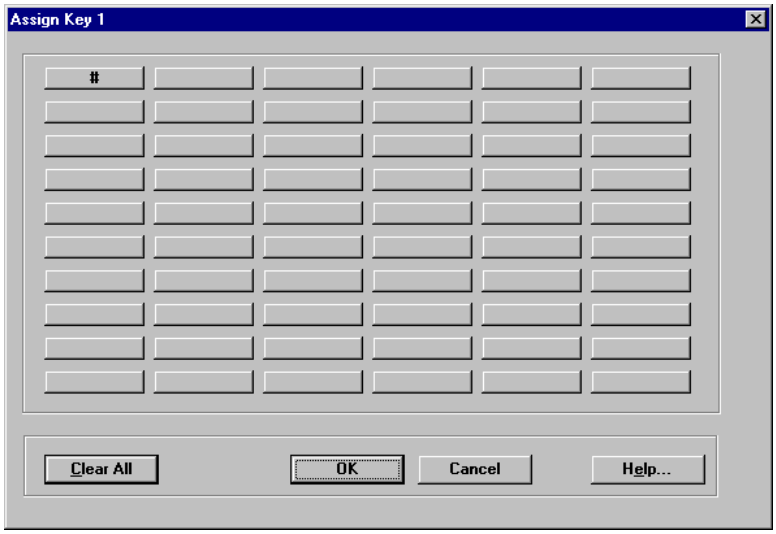


Figure 2.1.3

Repeat this procedure for all of the key sequences that you require to form this macro. For example, I want this macro to be [# 56.9 ENTER] (Figure 2.1.4). Note that you don't have to build a macro for each key. The key can be a single key, for instance the $ sign or F1.

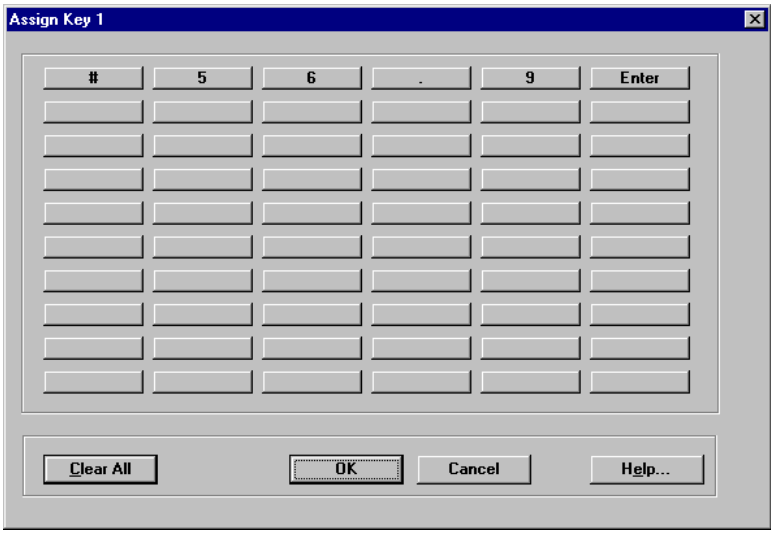


Figure 2.1.4

When you are finished, press the OK button on the above screen to record this macro for the selected key. (Figure 2.1.5)

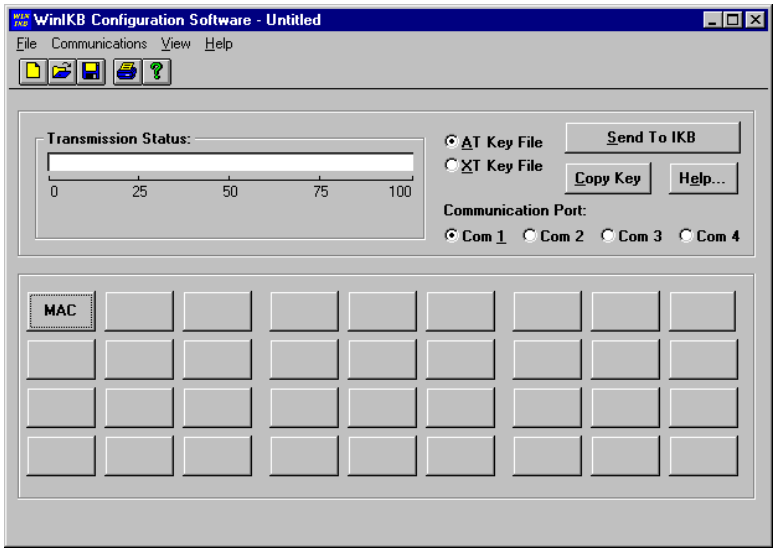


Figure 2.1.5

A separate record is kept for each key, and all of these records are bound together into a file. At this point, it is best to Save the file. As with any program that you are working with, save the file every few minutes to prevent loss of your program.

✓ Some keys and key sequences cannot be programmed by the **WinIKB**. The [Num Lock], [Scroll Lock], [Sys Req] and [Pause] keys cannot be programmed, also [Ctrl]+[Alt]+[Del] is a key sequence that cannot be programmed. Obviously the arrow keys and [Enter] key cannot be programmed, but your Industrial Keyboard is already provided with these keys.

2.2 File

The key assignment file, created using the editor, can be saved to your system and, once saved, can be reloaded into the computer using the 'File' option from the menu. When saving the file to your system the extension will default to **.IKB** and will be placed under the directory Quartech\QSM. It is best to retain the extension IKB in order to make it easier to find the files on your hard drive.

2.3 Send

The 'Send To IKB' menu option must be used to send the key assignment file out your computer's serial communication port, to the IKB-1000. Follow these steps for trouble free operation:

1) Connect the IKB-1061 File Transfer cable to the serial port located at the left side of the rear cover on the IKB-1000. Also insert the power supply power plug into the socket at the bottom of the rear cover.

2) The IKB-1000 has two round DIN connectors located at the bottom of the rear cover; one to connect an external keyboard, and one to connect the IKB-1000 to your computer. Remove any cables that may be connected to the DIN connectors. There should not be any cables connected to these, while programming the IKB-1000.

3) The other end of the File Transfer cable (the 9-pin female) should now be plugged into the computer's serial port (COM1, COM2, COM3, or COM4).

4) Apply power to the IKB-1000 by plugging the wall mount transformer into a 120 VAC wall socket. The LED, next to the serial port, should light amber.

5) Select 'Send To IKB' from the menu (Figure 2.0), to begin the transfer.

The computer will transmit the data file out COM1, COM2, COM3, or COM4 depending on the serial port selected on the Main Screen. (Figure 2.0) If everything goes well, it will take only a few seconds to transfer the file. When the file transfer is complete, the status LED on the IKB-1000 will flash green. If the transfer is not successful, the LED will flash red.

After the key assignment file is successfully programmed, the IKB-1061 cable and power supply must be removed from the IKB-1000 before normal keyboard operation can begin. If the cable is left in place, the unit will enter program mode every time power is applied.

2.4 Options

Import DOS Files:

WinIKB allows you to Import file that were created under the IKB-1080 Software. From the File Menu, select “Import IKB 1080 DOS File”. You will then be directed to enter the file name. The key sequences can then be edited.

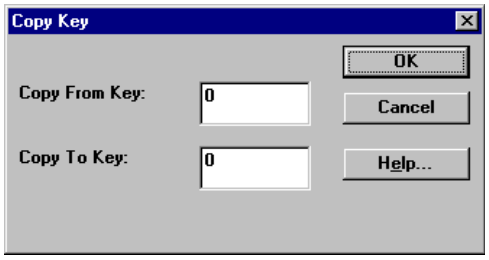
XT Key File:

By default the IKB-1000 is configured as a PS/2 type keyboard. It will work with PS/2 type computers or PC/AT type computers. The IKB can be configured as a PC/XT type keyboard by selecting 'XT Key File' from the Main Menu. (Figure 2.0)

Print File:

The print function is selected from your Tool Bar or from the File Menu. This option prints a list of keystrokes that are assigned to each of the 36 keys.

Copy Key:



The Copy Key button may be selected from the main screen to aid in the creation of an IKB configuration file. This is useful to easily duplicate user-defined keys with many keystrokes or key sequences defined. Simply enter the key number(1 to 36) from which you would like to copy and the key number (1 to 36) to which you would like to copy and select OK. The copy option will not allow the same key number to be entered for both.

2.5 EXIT

Select “File” "Exit" from the Main Menu to leave the WinIKB Key Assignment Utility and return to Windows.

3.1 Keys and scan codes

All single character keys (i.e. number keys, arrow keys, function keys, etc.) are make/break and typematic. The make scan code is sent when the key is pressed. When the key is released, the break scan code is sent. If the key is pressed and held down, the IKB-1000 sends the make code, delays for 500 ms, and begins sending the make code for the key at a rate of 10.9 codes per second. Typematic operation stops when the key is released.

All multiple character keys (i.e. [Shift]+[key], [Ctrl]+[key], and [Alt]+[key]) are make only. When the key is pressed, the IKB-1000 sends the make scan code sequence immediately followed by the break code sequence. For example: the [Shift+F1] key will send the Shift key make code then the F1 make code immediately followed by the F1 brake code and the Shift key brake code. No typematic operation is performed, and no scan code is sent when the key is released.

3.2 Cabling

The IKB-1000 communicates with the Computer via a detachable, serial communication cable (model IKB-1063). One end of the cable should be plugged into the IKB-1000, at the connector labeled "IKB-1000 OUTPUT". This connector is located at the bottom of the rear cover. The other end of the cable should be connected to the computer's keyboard port. If necessary, use the "6 Pin Mini-DIN to 5 Pin DIN" adapter provided with the IKB-1000.

The port labeled "AUXILIARY KEYBOARD INPUT", is provided to allow an auxiliary keyboard (perhaps a standard 101 key keyboard) to communicate with the computer at the same time as the IKB-1000. The "5 Pin DIN to 6 Pin Mini-DIN" adapter is provide for use with external keyboard having 5 Pin DIN connectors.

The IKB-1000 is powered by the computer, through the keyboard cable. The computer supplies 5 VDC at no more than 275 ma.

The communication signals are low voltage (5 VDC) signals, therefore extra care should be taken when routing the communication cable. Follow these guidelines for a trouble free installation.

✓ Use only shielded cable, and do not use a cable that is more than 10 feet long.

✓ Keep the cable away from AC power lines. If possible, keep the cable at least one foot from 120 VAC lines, and at least two feet away from higher voltage lines.

✓ If the cable must cross AC power lines, cross them at right angles.

✓ If you route the cable through conduit, the conduit should contain only other low voltage communication cables or DC signals. Do not run the cable in conduit that contains AC power lines or RF communication signals.

✓ Keep the cable away from sources of high energy fields such as arc welders, AC motors, motor starters, servo controllers, generators, induction heaters, and transformers.

3.3 Legend Cards

Along with the WinIKB program you will find the program LegendMaker. LegendMaker is a program that is used to make inserts for all of Quartech Products. Using LegendMaker you can enter text or bitmap images for each of the 36 keys. The are numbered from 1-36 from the upper left to the lower right (i.e. left to right, top to bottom). LegendMaker has a very extensive help menu. I will therefore not go into the actual program in this manual. A set of legend cards are then printed out on either a color or laser printer, which ever you have. We have found it best to laminate both sides of the cards, then cut them to fit.

Each of the 36 user defined keys have a 7/8" square legend area which allows the user to label each key. The legend cards are kept clean by inserting them into a 'see through' pocket underneath the polyester overlay.

To gain access to the pocket in the keyboard overlay, it is necessary to withdraw the keyboard assembly from the IKB-1000 bezel. To do this, remove the 18, No.6, keps nuts from the rear of the keyboard backing plate. The keyboard assembly can now be removed from the bezel.

The three legend card pockets are open at the top edge of the keyboard overlay. After producing the each legend cards, carefully cut it to size and insert it into the pocket from the top down. Assembly of the keyboard to the bezel is the reverse of removal; take care to align the gasket properly and to tighten the 6-32 hex keps nuts to 12-14 inch-pounds.

3.4 Status LED

The IKB-1000 is provided with a tri-color status LED visible through a hole in the rear cover.

IKB-1000 Status LED Summary

LED Status	Indication	Possible Cause
Steady Green:	Normal keyboard operation.	
Steady Red:	Basic Assurance Test (BAT) failure.	Bad key assignment file. Power down then up; if problem continues, reprogram the key assignment file (see Section 2).
Steady Amber:	The IKB-1000 is in program mode. It is waiting for download from computer.	The IKB-1061 cable is plugged into the IKB's programming port.
Green flash:	Key assignment file successfully programmed.	
Red flash:	Error on key assignment file download.	1) Not compatible key assignment file. 2) Time-out waiting for computer to download.

3.5 Troubleshooting hints:

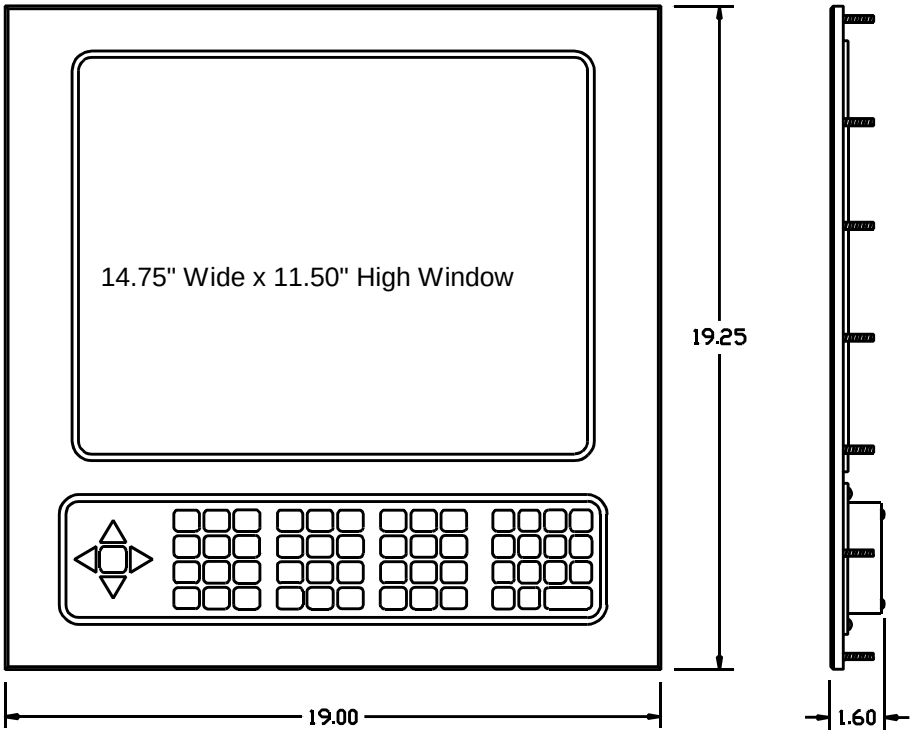
Caps Lock and Num Lock:

The Caps Lock and Num Lock functions of IBM personal computers are controlled by the computer, not the keyboard. When you press the [Caps Lock] key on your keyboard, it sends a signal to the computer to enter Caps Lock mode. The computer will stay in Caps Lock mode, even if the keyboard is removed, until you press the [Caps Lock] key again. The same is true for Num Lock. If the computer is in Caps Lock or Num Lock mode when you plug in your IKB-1000, operation may not be as expected.

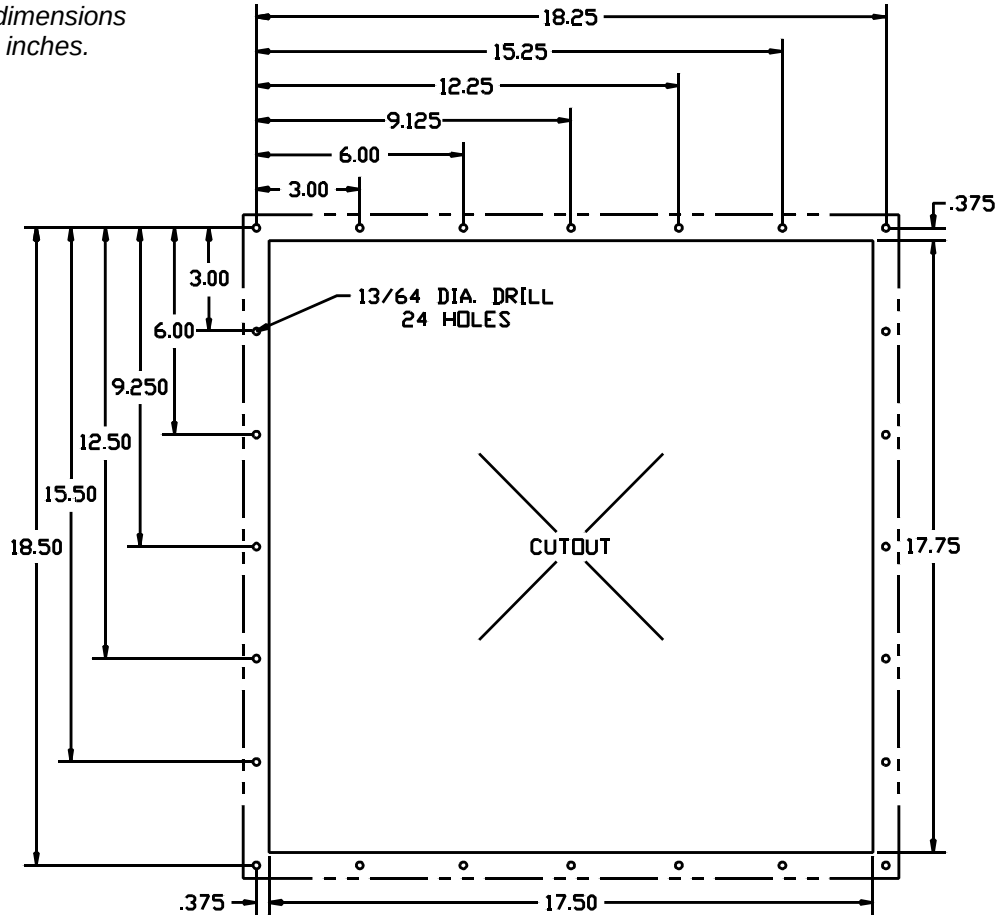
Scan Code sets (AT/XT Mode)

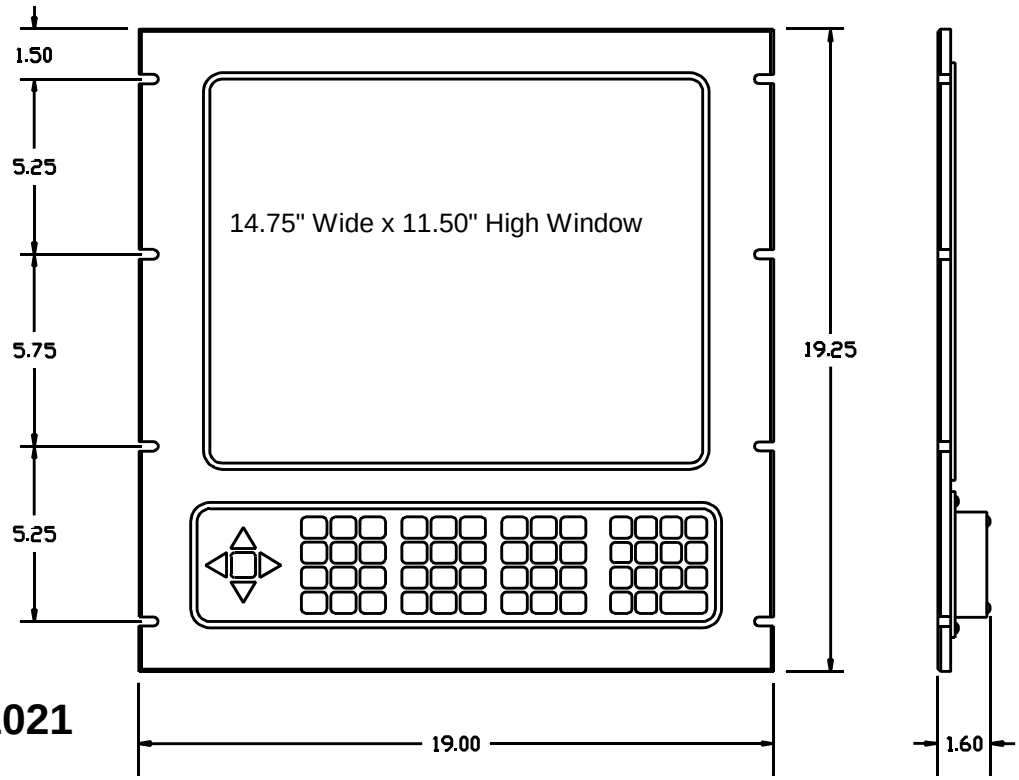
The IKB-1000 will transmit either PS/2, AT (scan code set 2) or XT (scan code set 1) scan codes. If the keyboard apparently does not work, it may be set to transmit the wrong scan codes.

IKB-1011



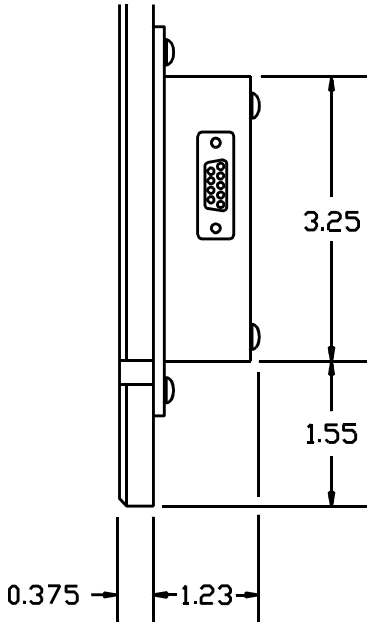
All dimensions in inches.





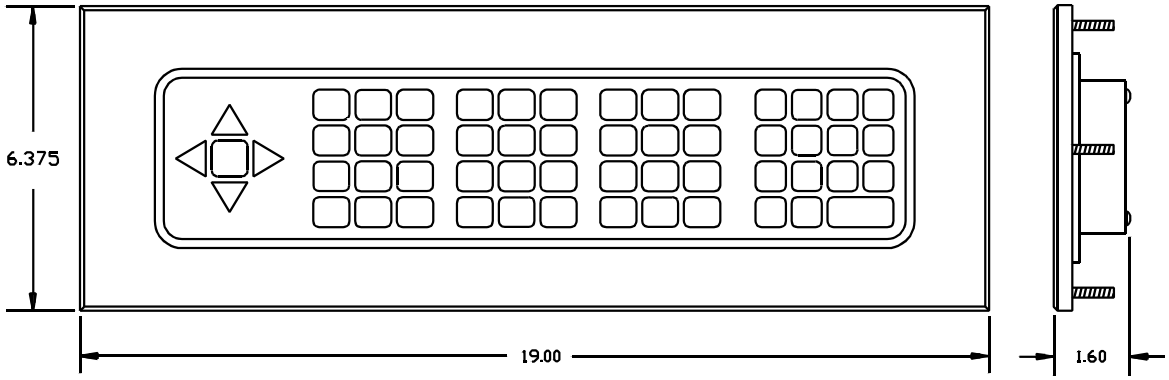
IKB-1021

Side profile is typical for all units.

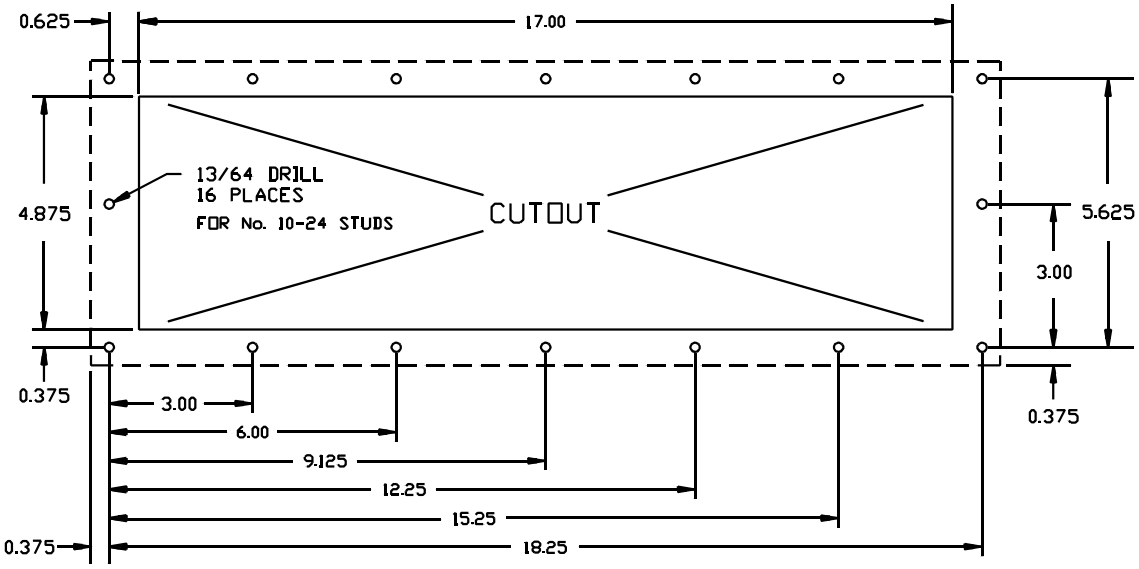


All dimensions in inches.

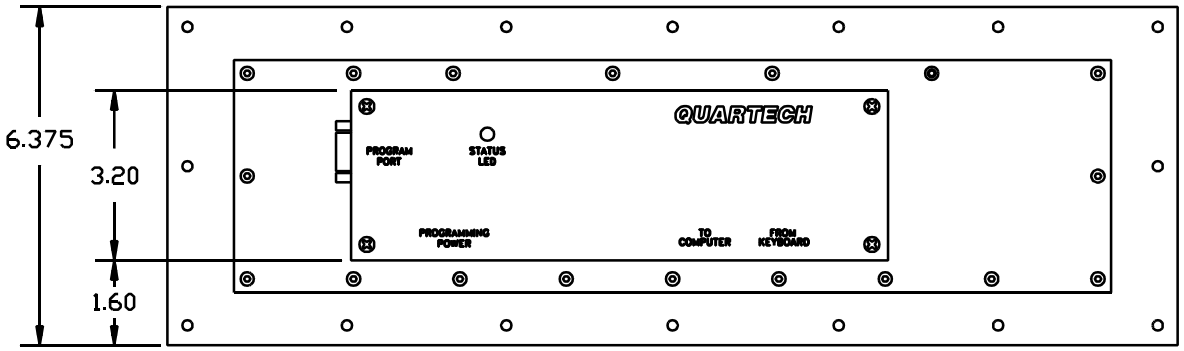
IKB-1041



All dimensions in inches.



IKB-1041 (Rear View)



All dimensions in inches.