



Genovation's Keypad Redefinition Program (Macro)

The Keypad Redefinition program is a Win32 application (Win95, Win98, WinNT, Win2000) that allows you to program either Keyboard Macros or Shell Commands for each key on your Micropad or Addpoint keypad. Some of our products are sold under other names such as Port NW627S, but the behavior of all these products is consistent. Using a standard "point and click" interface, you can easily program the keypad for your specific application.

The File Format

Although the Redefinition file format is very simple and is really the heart of how everything works, the Redefinition program was designed to hide the complexities of programming each key with Scan Codes by hand. The Redefinition file is just a simple text file and if you wish to see what it looks like, then you can use the Windows Notepad(tm) to view it.

Basic Operation of the Keypad Redefinition Program

Fortunately, the Keypad Redefinition program spares you from the pain of having to manually create a Redefinition file. Using a "point and click" interface, you can easily create keyboard redefinitions without knowing how to use hexadecimal numbers or having to look up Scan Codes.

The buttons in the upper half portion of the window represent the keys on the Keypad in both "Numlock On" and "Numlock Off" states. Using the mouse, select the key you wish to program; the redefinition program will highlight that key so that you know which one you are currently programming.

Two Choices: You can choose to either have the currently selected key output a custom keyboard macro, or you may choose to have it launch an application. Any keystroke values that are programmed for that key will show up in the grid immediately to the right of the keypad layout. The values are displayed from left to right and then top to bottom in the grid. If a shell command is chosen instead of a macro, then the file name will be displayed in the text box to the right of the keypad. You may choose to launch an application or specify a Windows Shell Command. It may be necessary to specify the full path name of your application if the file is located in a directory not listed in the PATH environment variable.

Examples of Windows commands:

Explorer
 telnet
 ftp
 command
 sysedit
 iexpore
 mailto: recipient@somewhere.com

Examples of applications (including support for parameters):

C:\Program Files\Netscape\Communicator\Program\sendto32.exe (may be different for you)
 C:\Program Files\Netscape\Communicator\Program\netscape.exe -mail (may be different for you)

The bottom half part of the window is a Standard U.S. PC keyboard layout. So if you working in a European country for example, then you may have to make some modifications as to how you program the Keypad. For example, to program the value "6" to be output on a French version of Windows, then you will have to program your key on the Keypad to output a Shift-Down, then the 6, then a Shift-Up. Note that you cannot use the PC's "Real" keyboard to type the characters. We chose to make this limitation on purpose because Windows intercepts and processes too many different keys to make this viable.

Editing Macro Keystrokes:

You can however use your cursor keys on your "real" keyboard or mouse to select any value in the grid. At this point you can press either Delete or Backspace on your "real" keyboard to remove those values. You can also "Double-Click" with your mouse to delete the currently selected value. Likewise you may insert new values anywhere in the Grid by simply positioning your cursor at that location using the cursor keys or your mouse, then clicking on the "fake" keyboard layout in the window.

The Numlock Key on the Micropad and Addpoint Keypads:

The Numlock key is dual purpose. Like the other keys on the keypad, the Numlock key is capable of being programmed and can emit a different sequence of Codes depending upon the keypad's current state (normal or numlock). Which brings us to the other function, unique to the Numlock key, is that pressing it toggles the state of the keypad between the Cursor mode and the Numeric mode.

One important point to note about the Keypad Numlock key is that it does not affect Windows' numlock state. The normal/numlock mode of your Micropad or Addpoint product is maintained either internally by the keypad or the Driver Software. Simply pressing the Numlock key *does not* have the same effect as pressing the Numlock key on the main keyboard. Of course, using the Keypad Redefinition program, you can instruct the Driver Software to send the Code Sequence for a Numlock key to the system, thus causing the main system to toggle the Numlock mode.

The File Menu:

The File pull-down menu contains the following items: New, Open, Save, SaveAs, and Exit.

Don't worry, all menu options are intelligent enough to know that if you are working on something that needs to be saved, it will prompt you to save that first before invoking its action.

File->New allows you to begin a new definition file and gives you the choice of which keypad to create the definition for.

File->Open menu item will let you open an existing Redefinition file. By default, the File->Open dialog box will display all files in the current working directory and will list all files that end with the ".623", ".627", ".628", and ".633" extensions.

File->Save menu item will save the file to disk under its current filename. If this is the first time you've saved the file, File->Save behaves like File->SaveAs (see below) and will request a filename to save the file under.

File->SaveAs menu item lets you save the file using a filename of your choice (typically different than the current, default, filename). There is no need to supply the extension to the file as this is done automatically.

File->Exit menu item closes the Redefinition window and terminates the program.

Keyboard Basics - Make and Break Codes

When the Engineers at IBM developed the original PC, they designed the keyboard in such way where as it sends two scan codes every time a key is pressed: a make code when the key is first pressed and a break code when the key is released (the terms make and break are electrical engineering terms for a switch making electrical contact and breaking electrical contact). Since an eight-bit scan code value can represent 256 different values, IBM's engineers decided to use half of the valid codes (0-127) to represent make codes and the remaining values (128-255) to represent break codes. Typically though, Engineers like to think in terms of Hexadecimal notation so you'll see

us referring to the make and break code boundaries as (0-7F) and (80-FF). The file format used for this redefinition program uses Hexadecimal notation for everything. To convert Hexadecimal to Decimal you can use the built in Calculator program that comes with all versions of Windows.

Although most software ignores the break codes for most keys (generally, a program only needs to know when a key is pressed, not when it is released), there are a few keys for which make and break codes are both important. These are the modifier keys; this set includes the Shift keys, the Ctrl keys, and the Alt keys. Knowing when the key is pressed (i.e., the time between the make and break codes) is important because while the key is down some keys change their behavior (e.g., an "a" becomes an "A" when Shift is held down).

The Keypad Device Driver:

All Genovation's serial Keypad products come with Device Driver Software that enable it to work with Windows 95, Windows 98, Windows NT4, and Windows 2000. The Driver Software interfaces with the Serial Port on your computer and interprets what should be output through the Operating System. The driver reserves enough memory to allow you to program up to 63 make and break codes per key press.

Scan Codes vs. Keystrokes:

Note that "63 make and break codes per key" does not necessarily mean that a key press can inject 63 characters into a program. Shift, Control, Alt, and CapsLock all count as keystrokes, reducing the total number of characters you can inject into a program with a single key press. Furthermore, releasing modifier keys also count as a keystroke. For example, if you want to send the string "Hello There" to an application whenever you press a key on the Keypad, you will need to program 15 codes. The characters you would have to program would be:

Shift-Key-Down, h, Shift-Key-Up, e, l, l, o, space,
Shift-Key-Down, t, Shift-Key-Up, h, e, r, e

You may be asking, "Wouldn't it actually use 26 codes?" The answer is that each keystroke normally has 2 scan codes associated with it; Up and Down. However, to save programming space, we decided to only program the down code for all the keys except the Modifier keys (Shift, Ctrl, Alt) which are explicitly programmed with either the down or up code.

Programming Modifier Key Make and Break Codes:

For each key you program, the Redefinition program generates only the down code. The only exception is for the Shift, Ctrl, and Alt keys. The other exception is for the extended keys (Cursor keys, and two keys on the 10-key keypad area). In regards to the Modifier keys, you are allowed to program as many downstrokes as you like, but you must make

sure to have at least one up stroke programmed if you do that. If you make a mistake, when you try to save, the Redefinition program will warn you to fix it.

End

Technical Questions

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