



KEYBOARD PROGRAMMING UTILITY

USER GUIDE

for Windows 2000 / XP / 7 / 10

LOGIC CONTROLS, INC. dba BEMATECH

INSTALLING THE PS2 KEYBOARD PROGRAMMING UTILITY AND DRIVER

1. Make sure the PS2 programmable keyboard is attached to the computer.
2. Navigate to the folder where the PS2 utility and driver installation package is located. Double click the INSTALL.BAT file on the utility diskette.
3. Select the destination folder if necessary and click "Install" to start the installation process. Skip any warning messages by clicking "Yes" or "Continue".
4. When installation is completed, reboot the computer.
5. Utility can be started through Windows by clicking on **Start**→**Programs**→**LCI Keyboard Utility**
6. Select Keyboard model from the "Keyboard" menu on the menu bar to match the keyboard to be programmed. A blank template for the selected keyboard will be shown.
7. Either **read** the template from the keyboard or **load** from the **.tpl** template file (Select **Template**→**Load**→**KeyboardName.tpl**). You will have to navigate to this file within the folder that the utility file is located).

(You may also use the Keyboard Programming Utility by double-clicking the utility program file in the destination folder where the utility is installed.)

INSTALLING THE USB KEYBOARD PROGRAMMING UTILITY

1. Make sure the USB programmable keyboard is attached to the computer.
2. Navigate to the folder where the USB utility installation package is located.
3. Copy all files in the USB utility installation package folder to the destination folder.
4. Utility can be started through Windows by double-clicking on **KBWN.exe** Keyboard Utility program
5. Select Keyboard model from the "Keyboard" menu on the menu bar to match the keyboard to be programmed. A blank template for the selected keyboard will be shown.
6. Either **read** the template from the keyboard or **load** from the **.tpl** template file (Select **Template**→**Load**→**KeyboardName.tpl**). You will have to navigate to this file within the folder that the utility file is located).

MENU COMMANDS

[Template]

[New]	Clear all key definitions.
[Load]	Load key definitions from template file on disk. (*.TPL)
[Save]	Save key definitions to template file on disk. (*.TPL)
[Save As]	Save key definitions to template file on disk with new Filename. (*.TPL)
[Load Default]	Load key definitions from default template.
[Import Text Data]	Import key definitions data from a text file. (*.TXT)
[Export Text Data]	Export key definitions data to a text file (*.TXT)
[Exit]	Exit programming utility

[Keyboard]

Select programmable keyboard model to program (for example, KB5000)

[Key Edit]

[Clear Current Key]	Clear definition of key being highlighted
[Set ASCII Mode]	Set programming mode for current key to ASCII Code
[Set ScanCode Mode]	Set programming mode for current key to Scan Code
[Insert Caps Code]	Insert [Caps] function in key definition
[Insert Delay Time]	Insert inter-string delay in key definition
[Enter Level Separator]	Insert a Multi-level Separator Code in key definition
[Enter Shift Level code]	Insert a Multi-level Shift Code in key definition
[Enter ASCII Code]	Enter ASCII code value (1-240) directly
[Switch ASCII Display mode]	Display ASCII code string in decimal format
[Select Scan Code]	Displays an Input Scan Code Dialog Box with a drop down list of various Scan Codes (F6, Backspace, Space, Tab, etc.) for selection

[Configuration]

[Read From KB]	Read key definition data from programmable keyboard to utility
[Write Into KB]	Write current key definition data into programmable keyboard
[Config KB Properties]	Set or Change programmable keyboard features
[Config MR Properties]	Set or Change optional Magnetic Stripe Reader properties

[Testing]

[Keyboard Output]	You may test the keys you have programmed by selecting this function which opens a Test dialog box
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GENERAL STEPS IN PROGRAMMING THE KEYBOARD

1. Connecting the Keyboard

For PS/2 versions: Connect the programmable keyboard to the PC with the special interface cable provided. Plug the male PS/2 connector to the computer and if necessary, the standard PC keyboard to the female PS/2 connector on the interface cable or keyboard.

For USB versions: Connect the programmable keyboard to any USB port on the computer.

2. Starting the Utility

Start the Programming Utility by double clicking on the “KBWN” short-cut icon or by going to **Start**→**Programs**→**Logic Controls Utilities**→**KBWN (Folder)**→**KBWN**. You may also double click the UTILITY icon in the folder where the utility is installed.

3. Select the Communication Port

Select the appropriate communication port by selecting either “USB” or “PS/2” in the drop down menu.

4. Select your keyboard model

Depending on what model keyboard you have, click on **Keyboard** menu to select the correct keyboard name. The layout of selected keyboard will be displayed with a blank template.

5. Preparing the Template

The utility starts with a blank template (all key definitions are blank). An existing template can be brought into the utility as a starting point for editing. There are 3 ways to get existing template files into the utility -- “**LOAD**” from a .TPL file, “**IMPORT**” from a .TXT file, or “**READ**” from the Keyboard that contains the previously programmed template).

- a. LOAD - [Template] -> [Load], browse to select previously saved template file
- b. IMPORT - [Template] -> [Import Text Data], browse and select text file for import
- c. READ - [Configuration] -> [Read from KB]

6. Editing template

Refer to section below for details of editing key definitions. When key editing is done, configure properties of the keyboard in the “Properties” dialog if necessary (see section “MODIFYING PROPERTIES” for details). For the programmable keyboards with optional integrated magnetic stripe reader, also configure the MSR properties. Both keyboard and MSR programming data will be saved into a single template file.

7. Writing into the Keyboard

It is strongly advised that the template should be first **saved** into a .TPL template file for future reference and for programming multiple keyboards. After saving the file, click

Configuration→**Write into KB** on the Menu bar or click on the “Down Arrow” icon  on the toolbar to write the template into the keyboard.

EDITING KEY DEFINITIONS

1. Selecting Keys to Edit

Use Shift Key and the Arrows Keys on the standard keyboard to select the key for editing. Hold down the shift key and hit the arrow keys until the key to be edited is being highlighted.

2. Checking Key Definitions

The current key definition is shown on the single line “Key Content” text box below the keyboard layout.

3. Selecting Programming Modes

Programming mode is selectable for each individual key. Select the key to be edited and then click on **Key Edit** menu or the   icon on the toolbar to select the desired mode. Note that switching between modes will clear original content of the key.

Scan Code Mode

- Key definition entered as Scan Codes (codes that are sent by a standard keyboard to the PC)
- Allow entry of special key functions (e.g. F1 to F12, Shift, Ctrl, Alt, Arrows Keys, Windows Keys, Caps Lock, NumLock, Number pad keys, etc.)
- Emulate exact key operation sequences.
- Upper/Lower case status depends on Caps Lock and Shift key status.

ASCII Code Mode

- Key definition entered as ASCII string of characters.
- Simplify programming for entry of text string in the key definition (e.g. for entering login names, passwords, item names etc.) Note that if the text string is case sensitive, it is better to enable the “Use <Alt>+number key to make ASCII code” option in the **Configuration**→**Config KB Properties** menu.
- Send out ASCII codes in RS232 mode (optional interface). Note that keys programmed with Scan Code mode will send out Scan Codes via the RS232 port. If actual ASCII codes are required, all keys have to be programmed in ASCII mode. In this case, special function keys cannot be programmed.
- Special key functions that are not part of standard ASCII code (e.g. F1 to F12, Shift, Ctrl, Alt, Arrows Keys, Windows Keys etc.) cannot be programmed in ASCII mode.
- Decimal equivalent numeric values for ASCII codes (only 1 to 240 allowed) can be directly entered.
- ASCII mode can also be used to enter Scan Codes by entering the key token names.

4. Entering Key Definitions

Scan Code Mode

- In Scan Code mode, pressing a key will enter that key in the definition and shown as the key name enclosed between square brackets, [].

- For special function keys, use <ESC> and <Function Key> to enter their scan code in this mode. For example, to program <F9> into the key position, hit <ESC> first, followed by <F9>. To program <ESC>, hit <ESC> twice.
- Since the following 4 keys are used by Windows, we cannot use <ESC> + <Function Key> to program these keys: <F6>, <F10>, <Alt>, <PrintScreen>. These keys have to be programmed in ASCII mode by entering the key token names.
- The scan codes for multiple keys entered into one key will act as if all the keys were pressed consecutively without releasing the previous one. At the same time these keys will be released when the key at the programmable keyboard is released. Thus, to program <Shift-F2>, just enter <ESC>, <Shift>, <ESC> <F2>. To program <Ctrl-A>, just enter <ESC>, <Ctrl>, <a>.
- If a certain key has to act as if it is released (key up) within the programming string before the actual key is released, “release codes” have to be inserted manually:
 - For regular keys (including Shift, RightShift, and Ctrl), insert <ESC> & <f> followed by the key to be “released”. For example, to simulate press and release of the key, enter , <ESC>, <f>, . When <ESC> & <f> is entered, the display will show [0F0]. To release <Ctrl> key, enter <ESC>, <f>, <ESC>, <Ctrl>.
 - There are some keys that need special code combinations. For example, to release the <RightCtrl> key, use <ESC>, <e>, <ESC>, <f>, <ESC>, <Ctrl>. It will be shown as “[0E0][0F0][Ctrl]”.
 - For releasing <Alt> and <RightAlt>, type in [0F0][Alt] or [0E0][0F0][RightAlt] directly in ASCII mode.
- More examples on page 12.

ASCII Code Mode

- In ASCII mode, pressing a regular key will enter that key in the definition and be shown as a string of characters. Special function keys will be ignored or used to control entry of data (e.g. Backspace will erase previous character).
- There are some special codes used in ASCII code mode:
 - [Caps] Emulates function of CapsLock key. Used in RS232 mode to emulate Caps Lock function for POS keyboards. To insert [Caps] function, click on the  icon on the toolbar.
 - [CR] Carriage Return code. Used in RS232 mode to emulate <Enter> function.
 - [[Enters the character '[' character.
 -]] Enters the character ']' character.
 - [Separator] Separator Code used in Multi-level definition. Used to separate several definitions codes that work in combination with Multi-shift-level function key. Click on  icon to insert a Level Separator Code.

- [ShiftLevel*] Multi-shift-level function key definition for different shift levels (* is from 1 to 9). To define a Multi-shift-level function key, click on the  icon and enter the level number.
- Decimal equivalent numeric values for ASCII codes (only 1 to 240 allowed) can be entered directly by clicking on the  icon on the tool bar or **Key Edit**→**Enter ASCII Code** on the menu bar. After code entry, the ASCII code will be shown as a normal character or as blocks if the code is a non-displayable character. To view the decimal value, click on the  icon on the tool bar or **Key Edit**→**Switch ASCII Display mode** on the menu bar. The decimal value will be shown as [xxx].
- Special Function keys and scan codes can also be entered in ASCII code mode by entering the token names of the keys as a character string. For example, to define a key to press and release <a>, enter the string “[A][0F0][A]”. However, ASCII code and Scan code should NOT be mixed together in one key.
 - Each key is entered as a character string enclosed between square brackets, []. For example, [Ctrl], [Alt], [Enter], [A], [B], [1], [2], [=], [PAD3], [ESC] etc.
 - Full List of all token names of the keys can be found at end of this menu or click on **Help**→**Key Word List**
 - Token names are case sensitive.

5. Special Features

A. Multi-Shift-Level Function

- A single key can be programmed to output different codes when combined with the Multi-Shift-Level function keys.
 - To program multiple definitions into a single key, enter the different definitions separated by the [Separator]. The [Separator] can be inserted by clicking on the  icon on the tool bar or **Key Edit**→**Enter Level Separator** on the menu bar. It will be shown in the definition content as [Separator].
 - The definition content before the first [Separator] corresponds to the normal key output. The first definition content after the first [Separator] will be the Shift Level 1 output. Definition after second [Separator] will be the Shift Level 2 output, and so on up to ShiftLevel 9.
 - Certain designated keys will be programmed as Multi-Shift -Level function keys for activating multiple definition output of the multi-definition key. Multi-Shift-Level function keys can only be programmed under ASCII Code mode.
- To program a key as Multi-Shift-Level function key, click on the  icon on the tool bar or **Key Edit**→**Enter Shift Level code**. The definition will be shown as [ShiftLevel1] to [ShiftLevel9] corresponding to the Shift Level selected.
- After the keyboard is programmed, holding down [ShiftLevel1] key and then press the multi-definition key will send out Level 1 definition. Holding down [ShiftLevel2] key and then press the multi-definition key will send out Level 2 definition, and so on.
 - See examples on page 12.

B. *Inter-string Delay*

- A delay time up to 100 seconds can be inserted between key stroke outputs by clicking on the  icon on the tool bar or **Key Edit**→**Insert Delay Time** on the menu bar. For example inserting [Delay2] will cause keyboard to pause 2 seconds before sending out subsequent output.
- See examples on page 12.

(Note: After editing the template, it has to be written into the keyboard before the new key definitions can be used with the keyboard. In addition to writing to the keyboard, it is recommended that the template is saved into a .TPL template file for future reference and for programming multiple keyboards.)

MODIFYING PROPERTIES OF THE KEYBOARD

After key definitions are finished, click on the item **Configuration**→**Config KB Properties** on the menu bar or click on the “Modify Properties” icon on the toolbar to set or change programmable keyboard features.

Config OPOS/JPOS

- You may configure the keyboard according to which standard, OPOS/JPOS, your POS application is running.

Send break-code for scan-code mode key

- Enables the transmission of break codes for each scan codes programmed into the keyboard. A break code is a code that is sent to tell the PC that the key is being released.

Enable beep when a key typed

- Enables the entire keyboard from beeping when any key is depressed.

No beeping if a key is not defined

- If a key has no definition, it will not beep when depressed.

Translate code set #2 for PC/AT

- Enables the output of the keyboard to be translated into AT scan code.

Use <ALT> +number key to make ASCII code

- Enables the use of ALT key along with the numeric keypad to generate codes for definitions programmed in ASCII mode. This will allow output of ASCII characters in the specified upper or lower case independent of the Caps Lock status and Shift key status.

Enable typematic for scan code

- Enables keys programmed with scan code mode to repeat key outputs as long as the key remains depressed.

Enable typematic for ASCII code

- Enables keys programmed with ASCII code mode to repeat character output as long as the key remains depressed.

Inter-character delay (ms)

- The time delay between characters can be adjusted from 1 millisecond to 250 milliseconds. This delay is set for all key strokes or characters programmed into the keyboard. This feature should not be confused with the Interstring Delay feature.

Note: Some of the above properties require the keyboard to be reset to take effect. So, after downloading the template into the keyboard, it is necessary to unplug the keyboard and plug in again to reset it.

DELIMITED TEXT TEMPLATE FILE

The programmable keyboard utility can import and export a delimited text file directly. This allows users to edit a template with simple text editors or save readable text file for future reference. The text file may have two columns and as many rows as number of keys (See the example .TXT file in the utility diskette). Columns are delimited by commas and rows are delimited by <Enter>. The first column is key's name that will appear on the utility's key layout screen. These names can be also changed. The second column is key's definition.

- All rules and limitations on key definitions apply.
- Do not mix Scan Code and ASCII definitions.
- As the characters '[' , ']' , '\ ' and ',' have special meanings or functions, when they are used in the text file in the key name label field or key definition content field, following format has to be used:

```
[      -      [[  
]      -      ]]  
\      -      \\  
,      -      \,
```

Importing a Delimited Text File

- Use any text editor (e.g. Notepad) to create/edit a text file or use the Export Text Data function to convert the currently loaded template into a text file.
- Start the utility and click on **Template→Import Text Data**.
- Enter the text file name and hit <Enter>.
- If the file is not imported correctly, check if the text file has 2 columns and the number of row is equal to the number of key in programmable keyboard. Also check the proper format of '[' , ']' , '\ ' and ','.
- Note that keyboard and MSR properties are not imported. After importing text file, check and adjust keyboard/MSR properties if necessary

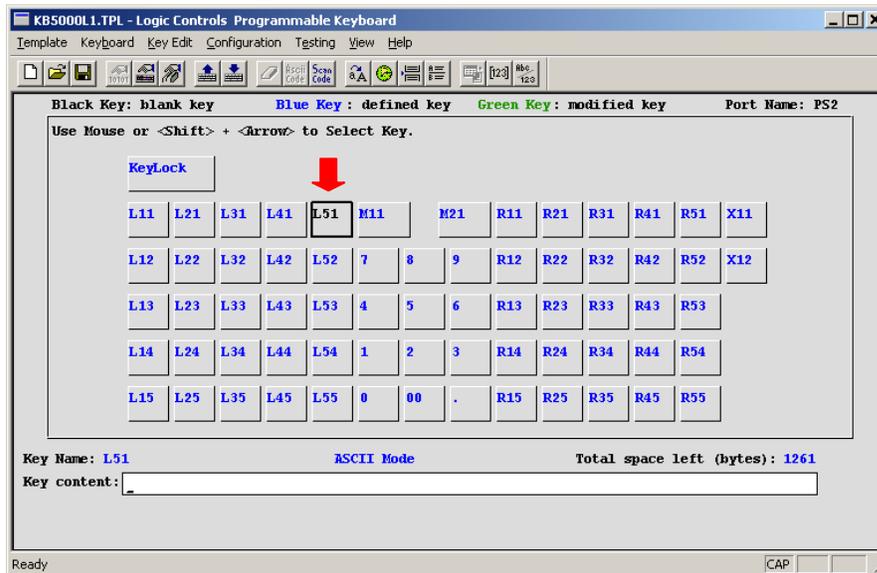
Exporting a Delimited Text File

- The simplest way to create a properly formatted template text file is to use the Export function.
- Start the utility and edit a new template, load from .TPL template file or read from keyboard.
- Click on Template→Export Text Data.
- Enter the text file name and hit <Enter>.
- The exported text file will have key name labels currently used on the screen. The name label field in the text file can then be edited with any text editor. When the new text file is imported the next time, the edited key names will be used as a label on the screen. (Note that loading a .TPL template file will not change the key labels).
- Note that keyboard and MSR properties are not exported.

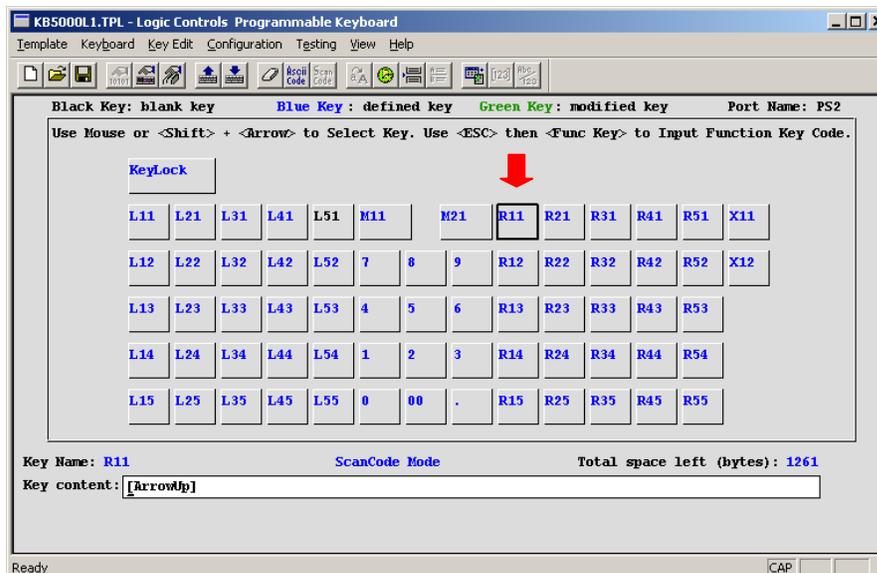
KEY LABEL COLOR

To identify the status of a key during template editing, the key label is displayed in three different colors.

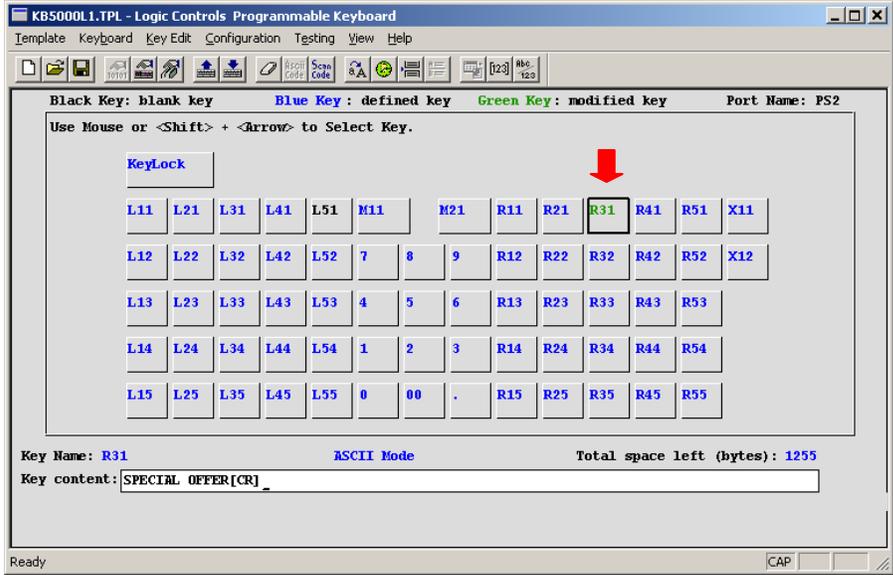
- Black - The key is blank with no definition.
- Blue - When a template is loaded from file or read from keyboard, all keys that are not blank will be displayed in blue.
- Green - When a key is modified after a template load or keyboard read, it will be changed to green to identify that this key has been changed from the original template.



In this example of the KB5000 template, the L51 key is a blank key and is indicated by the color black.



In this example of the KB5000 template, the R11 key is a defined key and is indicated by the color blue.



In this example of the KB5000 template, the R31 key is a modified key and is indicated by the color green.

PROGRAMMING EXAMPLES

1. Special Features

To program key sequence <Ctrl-A> then <F9>, the <Ctrl> key need to be released before pressing <F9>. Otherwise, the definition will be interpreted as <Ctrl-A>, <Ctrl-F9>.

- [Ctrl][A][0F0][Ctrl][F9]

2. Multi-Shift-Level Function

This function programs a key that contains several levels of definitions such as “Small Coke”, “Medium Coke”, “Large Coke”. When pressing this key, the actual output will be any of the 3 strings. We may call this a multi-definition key.

- Small Coke[Separator]Medium Coke[Separator]Large Coke. Two other keys are programmed as the Multi-Shift-Level function keys, Level 1 and Level 2.
- [ShiftLevel1]
- [ShfitLevel2]

If the multi-definition key is pressed alone, message “Small Coke” will be sent out. If the [ShiftLevel1] key is held down and the multi-definition key is pressed, message “Medium Coke” will be sent out. If the [ShiftLevel2] key is held down and the multi-definition key is pressed, message “Large Coke” will be sent out.

3. Inter-string Delay

Sometimes, when a key is pressed, the application software takes time to respond before the next key can be pressed. For example, after pressing <F2>, wait 1 second before entering <3> and <Enter>.

- [F2][Delay1][3][Enter]

4. Starting a Windows Program by pressing a Key on the Programmable Keyboard

To start a Windows Program, the [Win] key is used activate the Start menu and the Run command is used. Note that the whole key definition has to be done with Scan Code mode. Break codes have to be inserted where necessary to allow Windows to recognize the command string correctly. For example, release Win key, Shift keys and to enter more than one stroke of the same key (e.g. 00). To run a program in path “C:\Program Files\Test\Demo001.exe”, the following key definition is required:

- [Win][0E0][0F0][Win][R][C][Shift][;][0F0][Shift][\][P][R][O][G][R][A][M][Space][F][I][L][E][S][\][T][E][S][T][\][D][E][M][O][0][0][0F0][0][0][1][.][E][X][E][Enter]

TOKEN NAMES FOR SPECIAL FUNCTION KEYS

There are no ASCII codes for some function keys. They have to be programmed with Scan Codes. In key definitions, the following symbols represent their scan codes. The token name symbols are case sensitive. They have to be entered exactly as shown below.

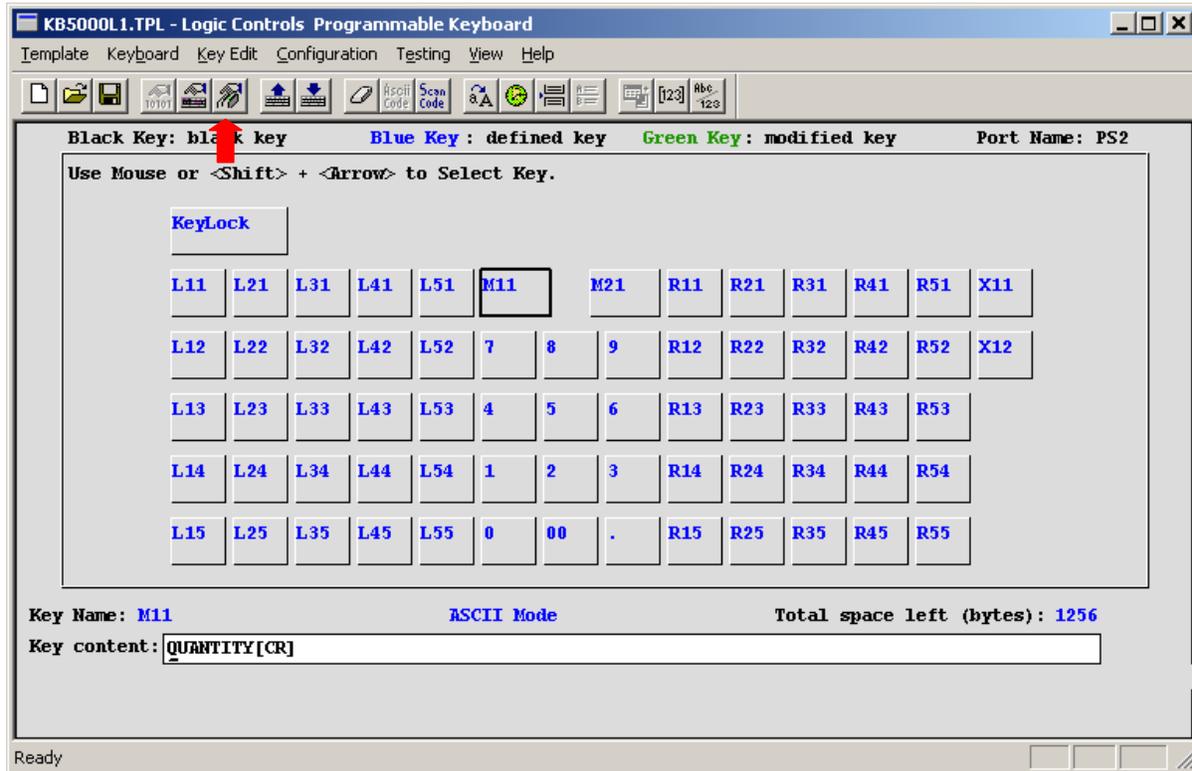
Symbol:	Function Key's Name
[F1]	Function key <F1>
[F2]	Function key <F2>
[F3]	Function key <F3>
[F4]	Function key <F4>
[F5]	Function key <F5>
[F6]	Function key <F6>
[F7]	Function key <F7>
[F8]	Function key <F8>
[F9]	Function key <F9>
[F10]	Function key <F10>
[F11]	Function key <F11>
[F12]	Function key <F12>
[ESC]	Function key <Esc>
[Backspace]	key <Backspace>
[Tab]	key <Tab>
[CapsLock]	key <Caps Lock>
[Enter]	key <Enter>
[Shift]	key <Shift> on left
[RightShift]	key <Shift> on right
[Ctrl]	key <Ctrl> on left
[RightCtrl]*	key <Ctrl> on right
[Alt]	key <Alt> on left
[RightAlt]*	key <Alt> on right
[Space]	key <space bar>
[Insert]*	Function key <Insert>
[Delete]*	Function key <Delete>
[Home]*	Function key <Home>
[End]*	Function key <End>
[PageUp]*	Function key <Page Up>
[PageDown]*	Function key <Page Down>
[ArrowUp]*	Function key <Up Arrow>
[ArrowLeft]*	Function key <Left Arrow>
[ArrowRight]*	Function key <Right Arrow>
[ArrowDown]*	Function key <Down Arrow>
[NumLock]	Function key <Num Lock>
[ScrollLk]	Function key <Scroll Lock>
[PrintScreen]	Function key <Print Screen>
[PauseBreak]	Function key <Pause Break>
[Win]*	Function key <Win> on left
[RightWin]*	Function key <Win> on right
[Menu]*	Function key <Menu>
[Ctrl+PauseBreak]	Function key <Ctrl>+<Pause Break>
[Ctrl+PrintScreen]	Function key <Ctrl>+<Print Screen>

[Alt+PrintScreen]	Function key <Alt>+<Print Screen>
[PAD0]	number key <0> on keypad
[PAD1]	number key <1> on keypad
[PAD2]	number key <2> on keypad
[PAD3]	number key <3> on keypad
[PAD4]	number key <4> on keypad
[PAD5]	number key <5> on keypad
[PAD6]	number key <6> on keypad
[PAD7]	number key <7> on keypad
[PAD8]	number key <8> on keypad
[PAD9]	number key <9> on keypad
[PAD+]	number key <+> on keypad
[PAD-]	number key <-> on keypad
[PAD*]	number key <*> on keypad
[PAD/]	number key </> on keypad
[PAD.]	number key <.> on keypad
[PADEnter]	number key <Enter> on keypad
[0E0]	scan code used for generating break codes of special keys (keys listed above with ‘*’)
[0F0]	scan code used for generating break codes

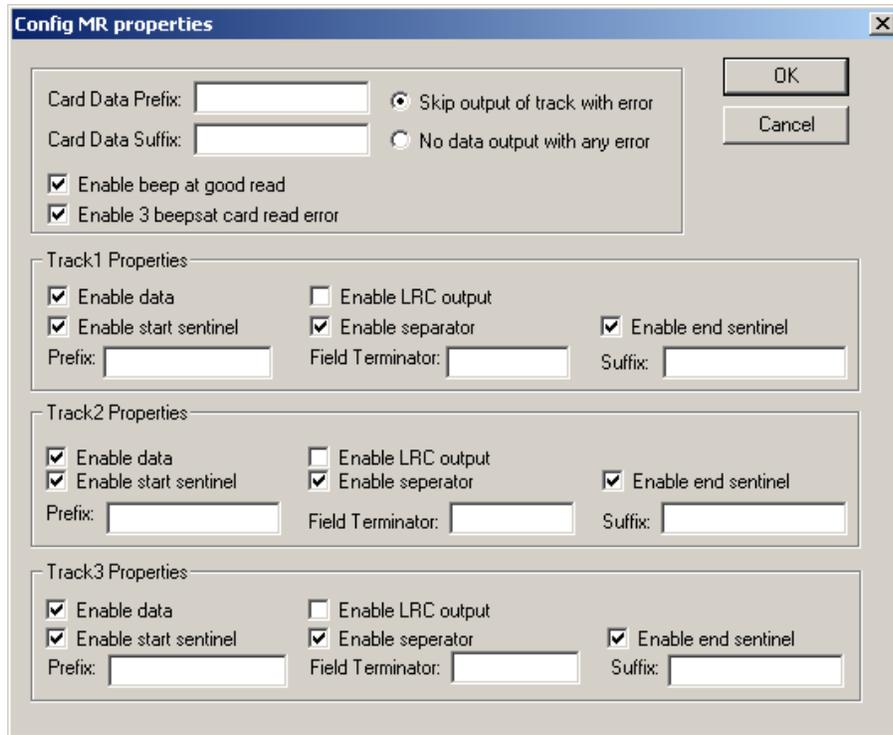
Note: Normal alpha-numeric characters and symbols are represented in scan code as the character itself enclosed in square brackets. For example [A] [B] [C] [1] [2] [3] [-] [;] [,] [/].

EDITING MSR PARAMETERS (for keyboards equipped with optional MSR)

Before editing the parameters, please refer to the user manual of the Point-of-Sale software or credit card verification software to find out what are the requirements on the output format. To configure the MSR from the KBWN.exe utility, click the Configure MR icon.



1. Edit the keyboard programming template; or load a template from a file; or read the template from the keyboard. In the programming utility main menu, click **Configuration** on the menu bar and then click on **[Edit MR Data]**. You can also click the "MR data edit" icon on the tool bar. The MSR parameter edit dialog box will be displayed.



2. For Prefix, Suffix, and Terminator, following special characters can be inserted with special formatted string (although there are 4 letters in the string, it will be considered as one character):
 - Carriage Return (Enter key) - [CR]
 - Tab (Tab Key) - [TB]
 IF "[" character is required in the string, enter "[[". For example, "[[T1]" will send out string "[T1]".
3. Card Data Prefix: maximum 4 characters, sent before card data output.
Card Data Suffix: maximum 4 characters, sent after card data output.
4. Skip output of track with error: do not output any track that was read with an error, other tracks without error will be sent to computer.
No data output with any error: do not output any data if any track was read with an error.
5. Enable beep at good read: when enabled, keyboard sounds a beep after a good card read.
Enable 3 beeps at card read error: when enabled, keyboard sounds 3 short beeps after a card read error.
6. Enable Data: enable track data output for each individual track.

Enable LRC: enable LRC output for each track. If enabled, LRC will be sent as 2 hex characters. Hex values A to F (10 to 15) are represented by characters : ; < - > and ? respectively.

7. Enable Start Sentinel: enable individual track "start sentinel" output.
Enable Separator: enable individual track "field separator" output.
Enable End Sentinel: enable individual track "end sentinel" output.
8. Track Prefix: maximum 8 characters, sent before start sentinel of each track.
Track Field Terminator: 1 character, sent before field separators in each track.
Track Suffix: maximum 8 characters, sent after end sentinel of each track.
9. Click [OK] after finishing parameter edit. Write the template into the keyboard. Save the template into a file for future reference and for programming multiple keyboards.
10. Verify MSR and keyboard output under Windows Notepad or the POS software.