PrehKeyTec

MCI Service Manual

May 2008

cb
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Introduction

The **MCI Family** consists of several variations of fully programmable keyboards available in white-grey or black with the following housing options:

- 3 track MSR
- Key Lock
- Touch Pad or Micro joystick
- Smart card read/write device

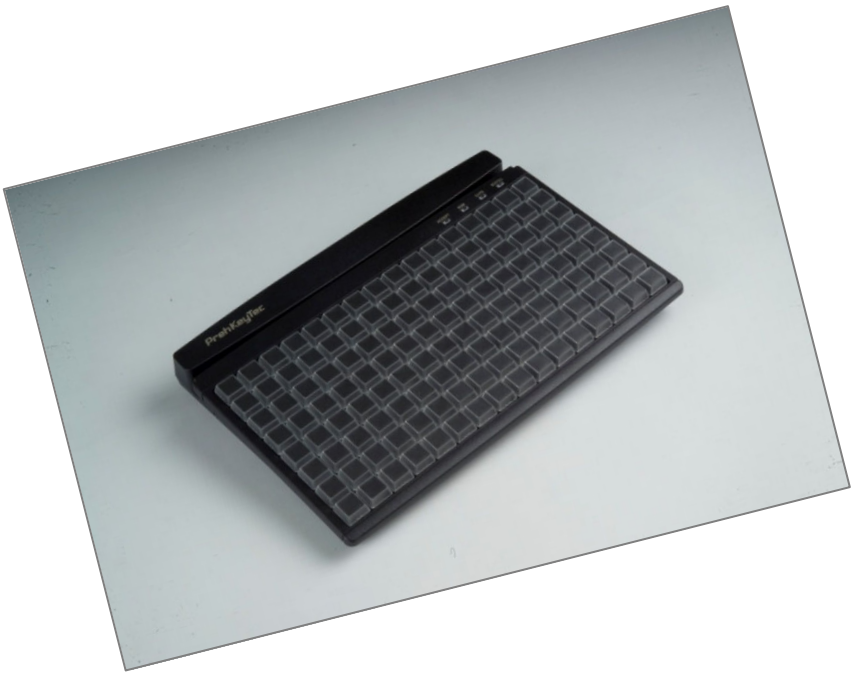
Keypad choices include:

- Row and Column layout in 30, 84, 96 and 128 key positions
- Alpha layouts in 128 and 96 key positions
- Alpha layout with calculator number block – MC1 3100

Interface choices:

- Attached PS2 cable
- Attached USB cable with PS2 adapter

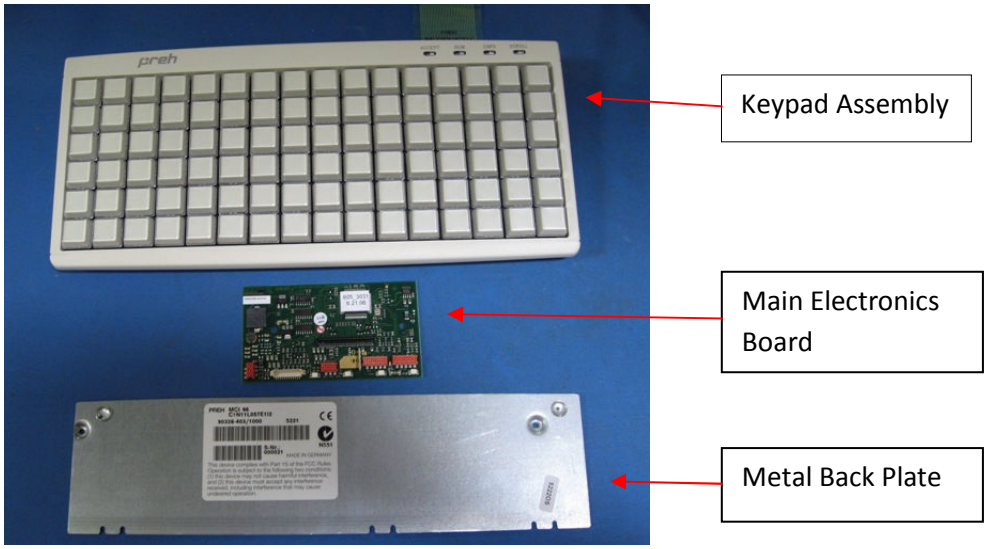
A software utility, **Preh Winprogrammer**, is available to program any desired value to each of the programmable keys and is fully compatible with Win95, WinNT, Win98, Win2000 and WinXP.



Component View

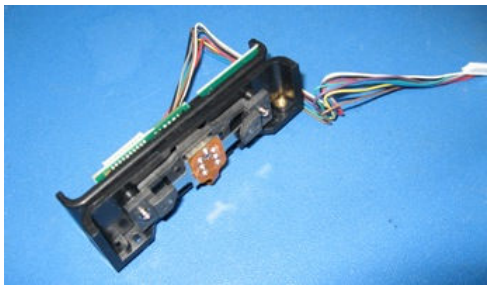
Each keyboard consists of :

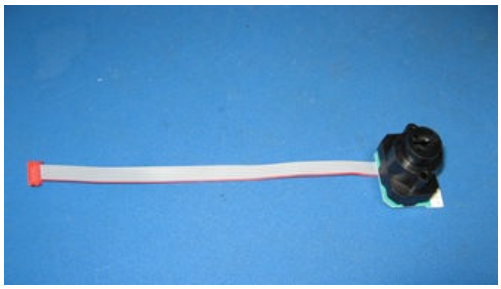
1. Keypad housing assembly
    a. Varied design based on other modules used
    b. All keypads have either laser printed keys or relegendable keys with a clear lens cap
2. Electronics board with flash firmware
3. Metal backplate



4. Attached PS2 or USB cable

5. Other modules such as magnetic strip reader or keylock





Basic Testing Guidelines for MCI Keyboards

The following is a basic summary of the necessary steps required for proper evaluation, diagnosis and repair of MCI keyboards.

1) Evaluation of customer complaint if available
2) Record date code and serial number for warranty qualifications
3) Observe condition of keyboard for signs of abuse, spills or other misuse
4) Connect keyboard to appropriate interface and observe LED's that stay on or flash
5) Test for initial output in Notepad or other word processing program
6) Reset to proper interface if needed
7) **Read and save custom program with C2K if possible**
8) Reset to factory default settings to see if problem is still apparent
9) Program with test program and test keypad/MSR and key lock if available
10) Replace parts as needed
11) Update firmware to latest version on all returns
12) Complete cleaning and refurbishing of keyboard
    a. Brush or blow out loose debris in keypad
    b. Clean keys tops and housing
    c. Clean MSR head with cleaning card if present
13) Restore custom layout and program if saved or load default program
14) Entry of required data in provided PrehKeyTec RMA Database

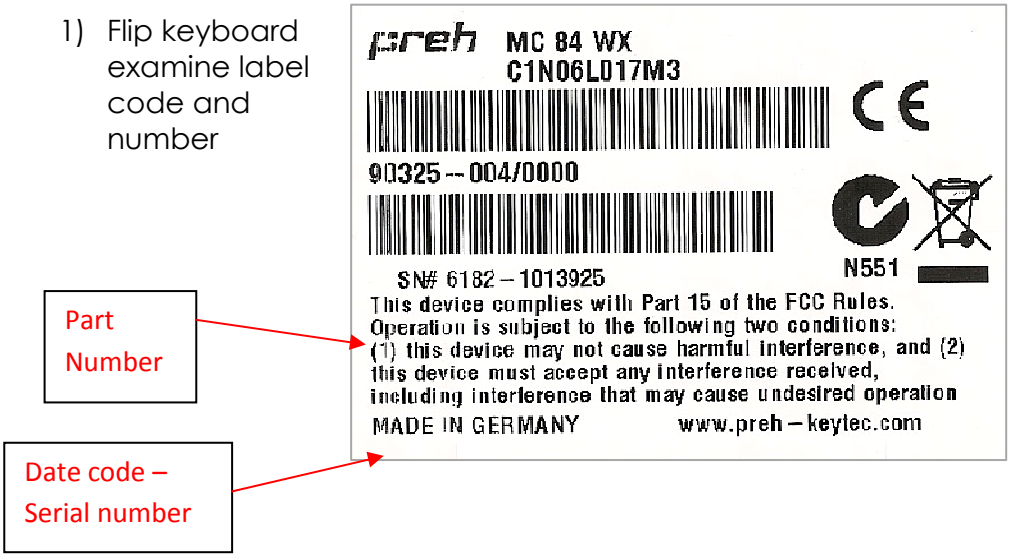

PrehKeyTec

Evaluation of Customer Complaint

1) Prior to any programming, firmware updating or parts replacement, determine accuracy of customer complaint.
2) Programming or updating the firmware may obscure the failure making it difficult to determine warranty status.

Record date code and serial number

1) Flip keyboard over to examine label for date code and serial number

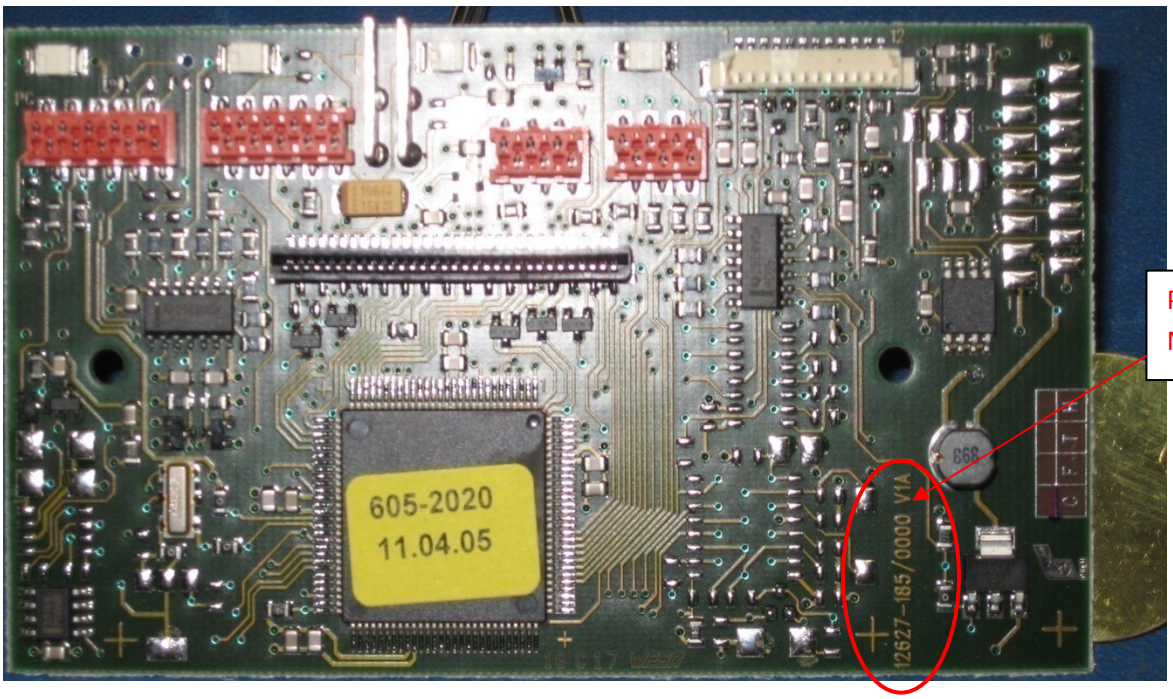


2) Interpret date code for warranty purposes
    a. In the example above 6182 is May 2, 2006
        i. The first number 6 is the year (2006)
        ii. The second two numbers 18 is the week (May 1-7)
        iii. The last number 2 is the day of the week (Tuesday)
3) If a returned unit is still within the warranty period the following should also be established.
    a. Inspect unit for obvious abuse or defects.
    b. If upon visual inspection the unit is found to exhibit evidence of liquid spillage, excessive abuse by the customer, or any form of non-manufacturer failure the warranty is considered void.
        i. In addition any unit previously opened by customer voids the warranty.

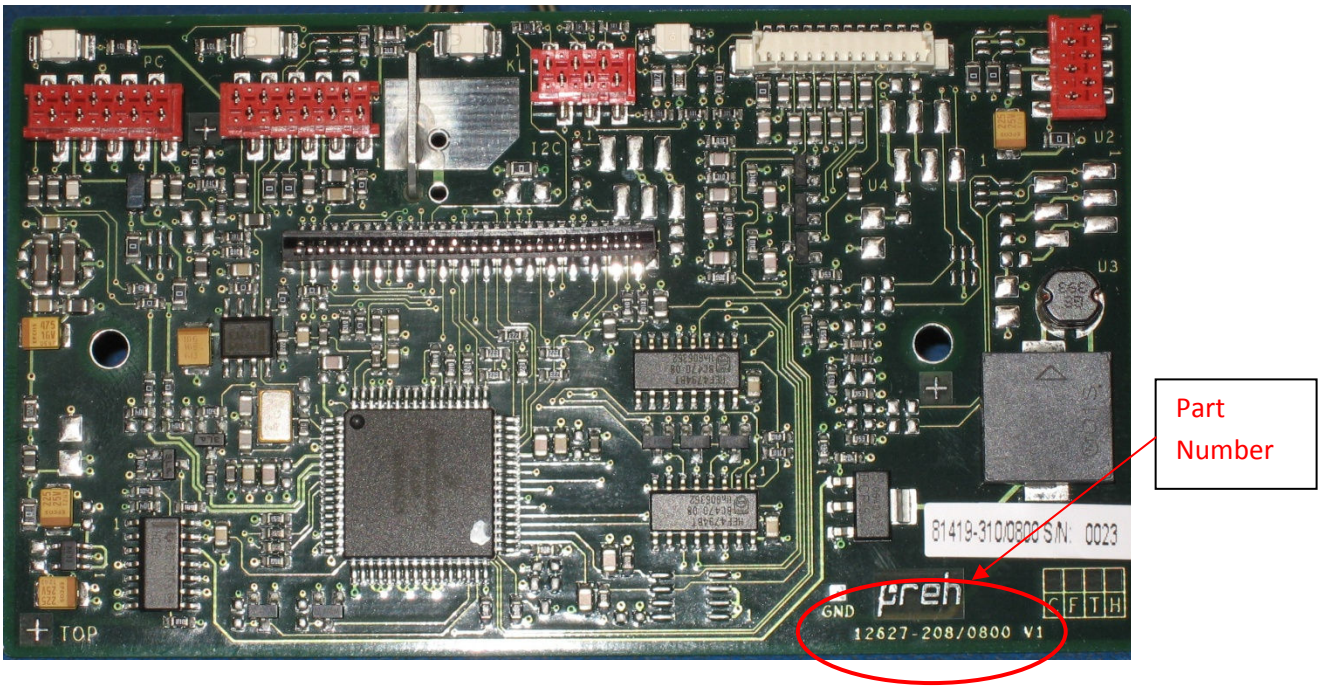
c. An estimate of the repair cost should be completed and the unit not repaired until the technician has advised management of the findings. Report the condition and obtain approval for the repair from the customer. Only after these steps are completed should the repair be completed.
    i. Often spills cannot be detected until after the keyboard has been opened for repair. If discovered during repair work should not proceed until the above steps are taken.

Initial Testing Procedures

1) Connect keyboard to the test PC using appropriate interface.
    a. It is best to Cold Boot (connect keyboard with the PC powered off then turn the PC on)
2) Check LED's after boot up.
    a) If accept light stays on or continues to flash then usually a firmware upgrade is needed.
    b) Replacement of the electronics board is sometimes necessary depending on the original date code and/or the part number of the board. Electronics with a part number of 12627-185/0000 cannot be updated and needs to be replaced.

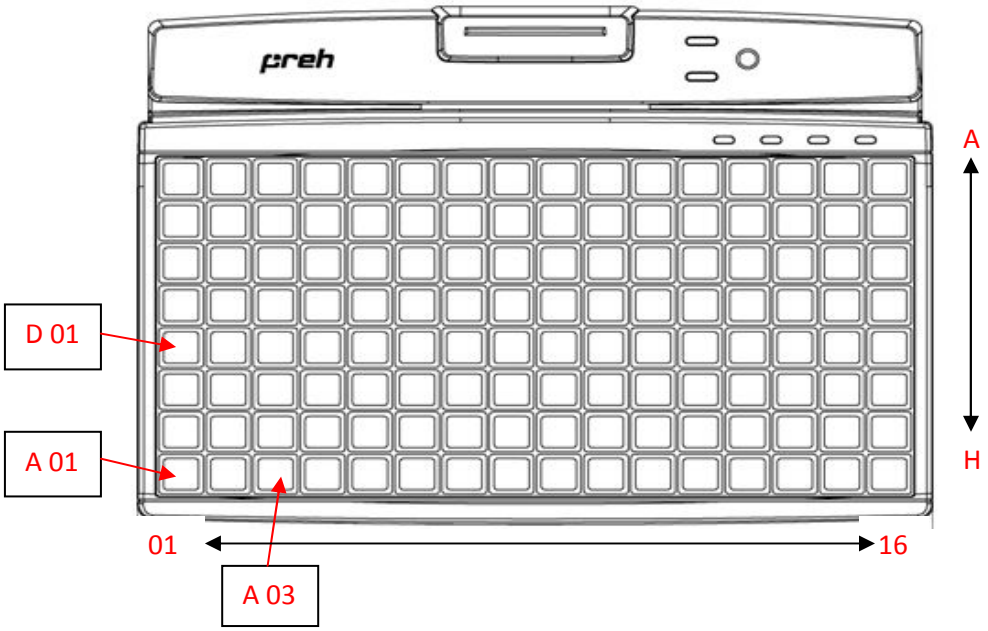


c) Electronics with the part numbers 12627-193/0000 or 12627-208/0800 can updated which usually solves most flashing or blinking LED problems.



b. If a firmware update is needed see Upgrading Firmware section on Page 22.

3) If the LED's are working properly open Notepad or other word processing program and test a few keys for a response.
   a. If a loud beep or no response is observed a reset should be done prior to programming or replacing any parts.
   b. Resetting a keyboard is performed by holding down a combination of keys during power up.



   c. See the following table for the correct key combinations to reset the keyboard to the proper interface if necessary.

KEY COMBINATION	**FUNCTION – (MCI / MC147 / MC140 / MF112)**
A01 + B01	Autodetect: PS/2 or USB Protocol
A01 + C01	Activate PS/2 interface
A01 + D01	Activate USB interface
A01 + A03 + A05	Activate a test keytable to check all key positions for electrical function
A01 + A03 + D01	Restore factory default keytable

4) Attempt to read the current customer program with the PrehkeyTec C2K Download Utility and save the file.

   a. This is necessary if the file should be checked for possible programming errors and /or if the customer would like the unit returned with their working program.

5) Reset to factory default keytable
   a. This is helpful in determining if the problem is due to a programming error. For example an unprogrammed key will not have a response and appear to be dead.
6) Download the correct MWF test file using the Preh Win Programmer or the C2K Download Utility
7) If downloading is not possible the electronics will need to be replaced.
8) If downloading is possible then proceed to testing the keypad.

Evaluating and Replacing the Keypad

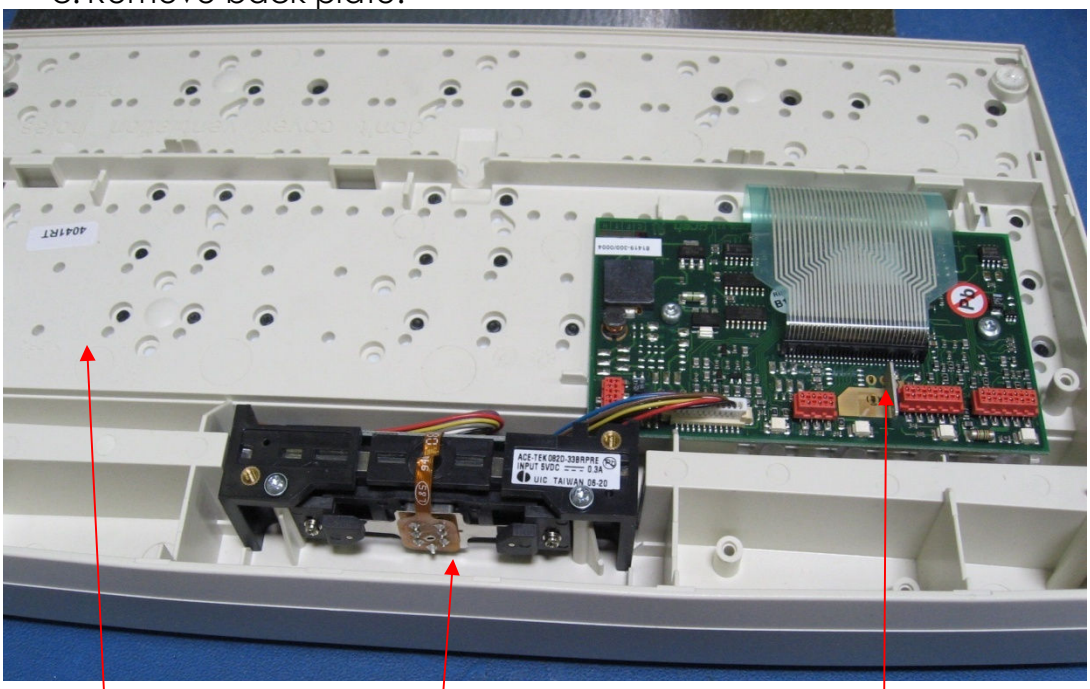
1) Open any program such as Notepad and press each key to note response and sound.
    a. When testing the keypad the technician should pay attention to electronic output as well as tactile feel (mechanical correctness).
2) When keys malfunction mechanically…
    a. For 1X1's, try rotating key(s) in question by 180 degrees and then reinstalling. For any other key size try uninstalling and reinstalling key 2 - 3 times. If malfunction (sticking) persists, try a new key(s) or keypad. Check feet on 2X1 keys for worn edges. Replace if needed.
    b. It is also possible that the guide frame may be broken. The technician should examine the black matrix board in detail for broken off pieces or parts. If the situation is non-correctable or a broken guide is found, replace the keypad.

Note: Before opening any electronic device for repair the technician must be grounded at a designated work bench / table via a grounded wrist strap.

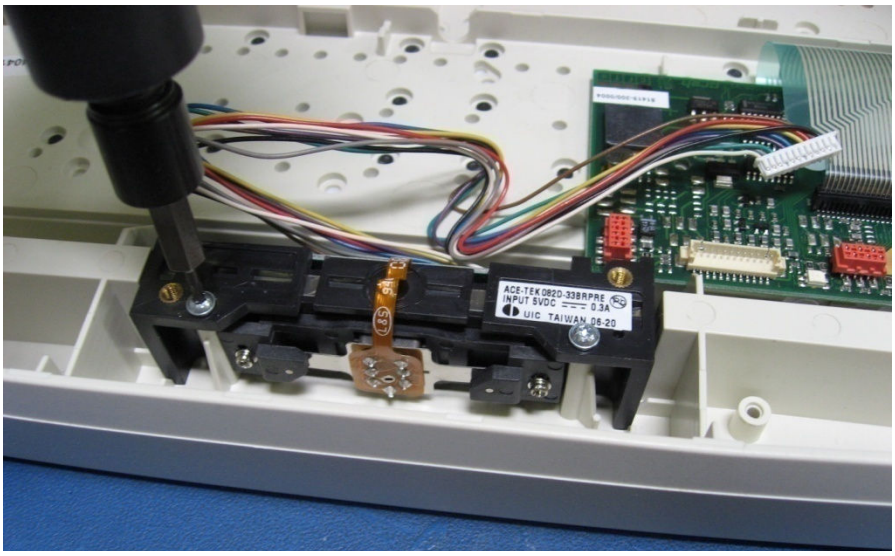
3) Changing the keypad.
    a. Place the keyboard face down on the work bench.
    b. Remove the two Torx screws fastening the metal back plate to the keypad assembly.

i. On some designs one of the screws may be located under the label which will need to be damaged when removing the screw.
    1. If it is not possible to replace the label it is advisable to add a small non-removable label to the back showing date repaired w/ initials of tech.
    2. It is not possible to remove and replace the original label.

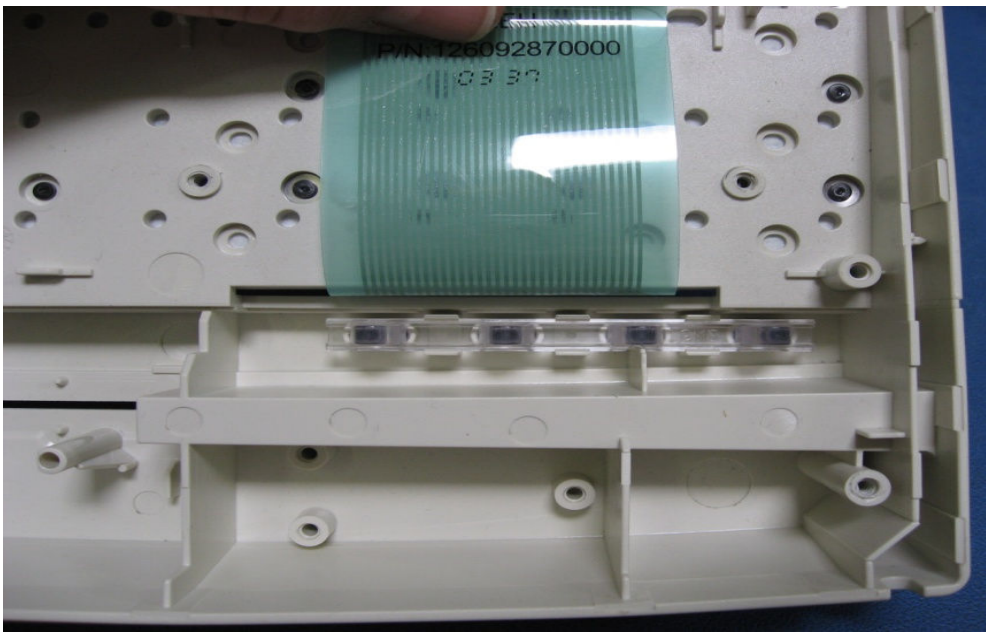
c. Remove back plate.



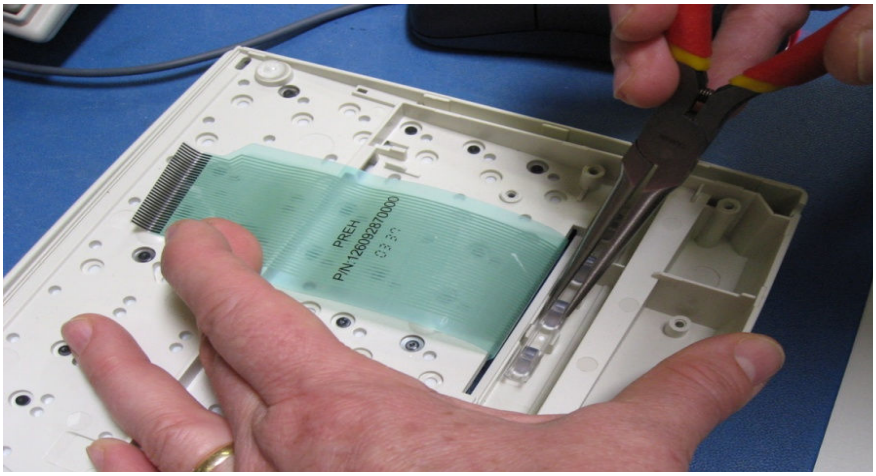
4) Disconnect MSR cable (if equipped) from electronics board.
5) Remove screws from MSR and set aside.



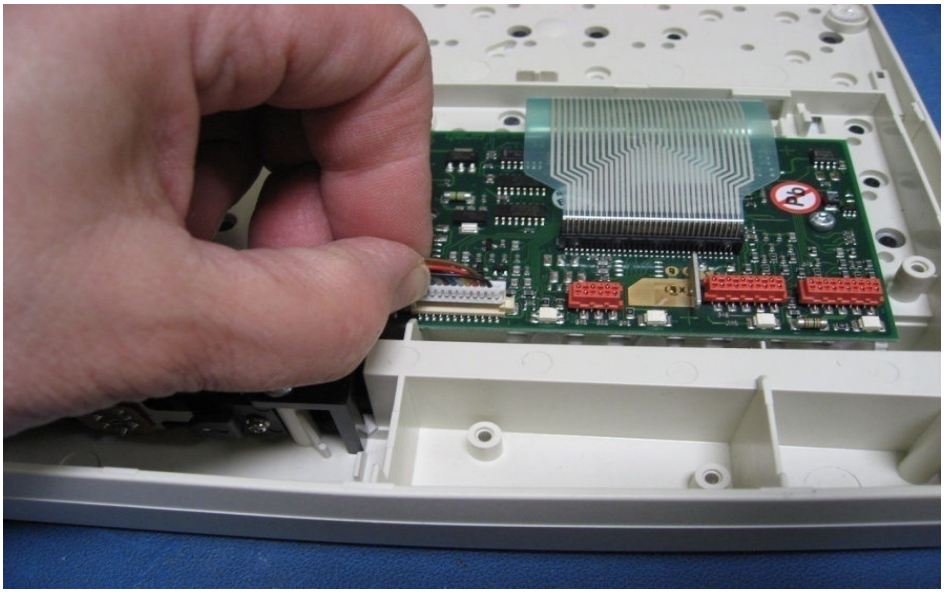
6) Remove main cable from electronics
7) Slide flextail end out of electronics and remove 2 Torx screws



8) Remove electronics board to observe clear plastic LED lens
9) Using a needle nose pliers pull lens straight up and out of the old housing for transfer to new keypad.
    a. Some keypad replacement parts come with this installed. If so then transferring the old lens is not necessary.

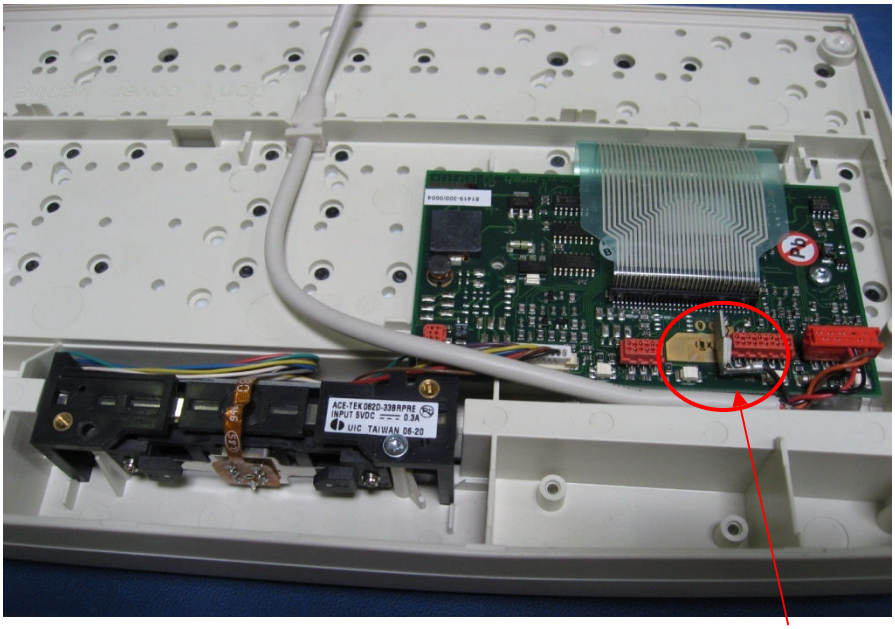


10) Remove new keypad assembly from plastic bag.
    a. Unlike the MC or PC POS series, the MCI keyboards are designed with the keypad and housing as a single repair part.
        i. The E1 style has no MSR section
        ii. The E2 style is sized for the MSR
        iii. The E3 style has the option for MSR and Smart card
        iv. If the MCI 3100 keypad has a glide pad it is part of the keypad assembly and not removable.
11) Reversing previous directions reassemble keyboard.
    a. Install LED lens
    b. Screw down electronics board and carefully insert keypad flextail.



c. Reinstall other components, MSR or key lock and attach cables to electronics.

d. Plug in USB or PS2 cable to proper connector on electronics and insert ground clip

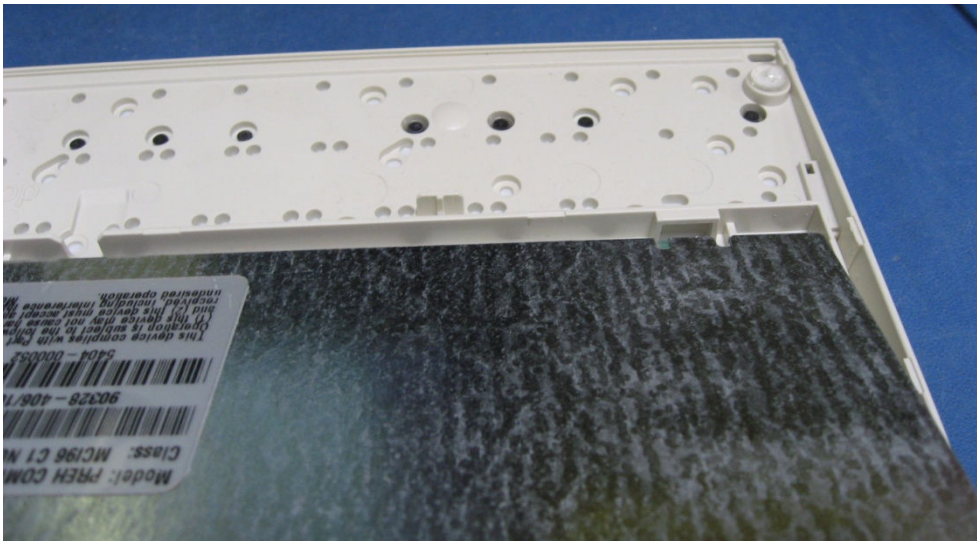


Ground clip

e. Position ESD connector so that metal back plate does not touch electronics board

ESD Connector

f. Replace back plate, taking care to insert into notches on keypad.

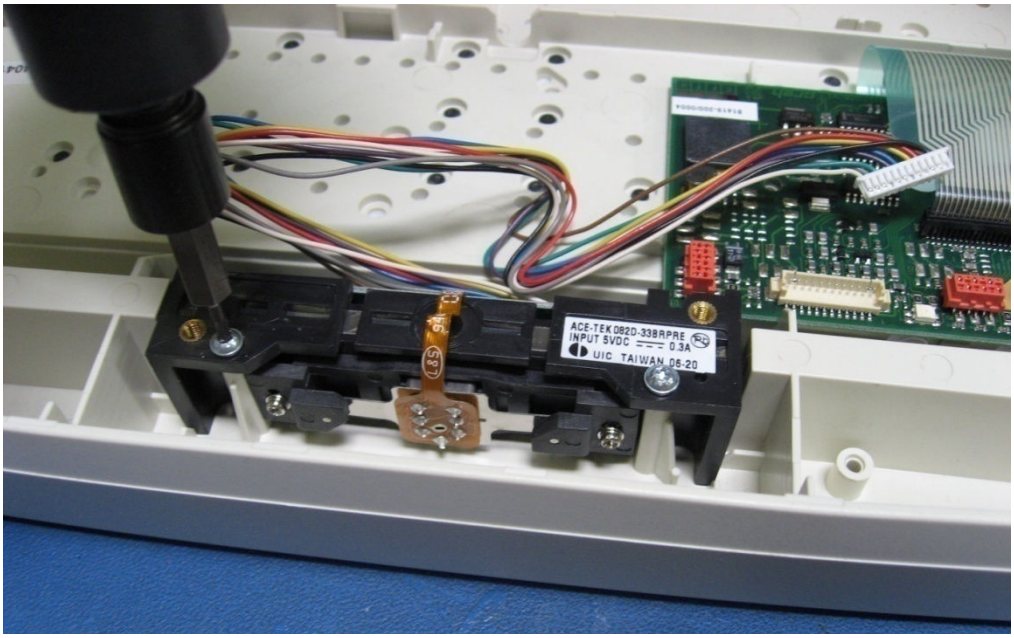


12) Flip keyboard front side up.

13)Clean and transfer all custom keys from old keypad to new one.

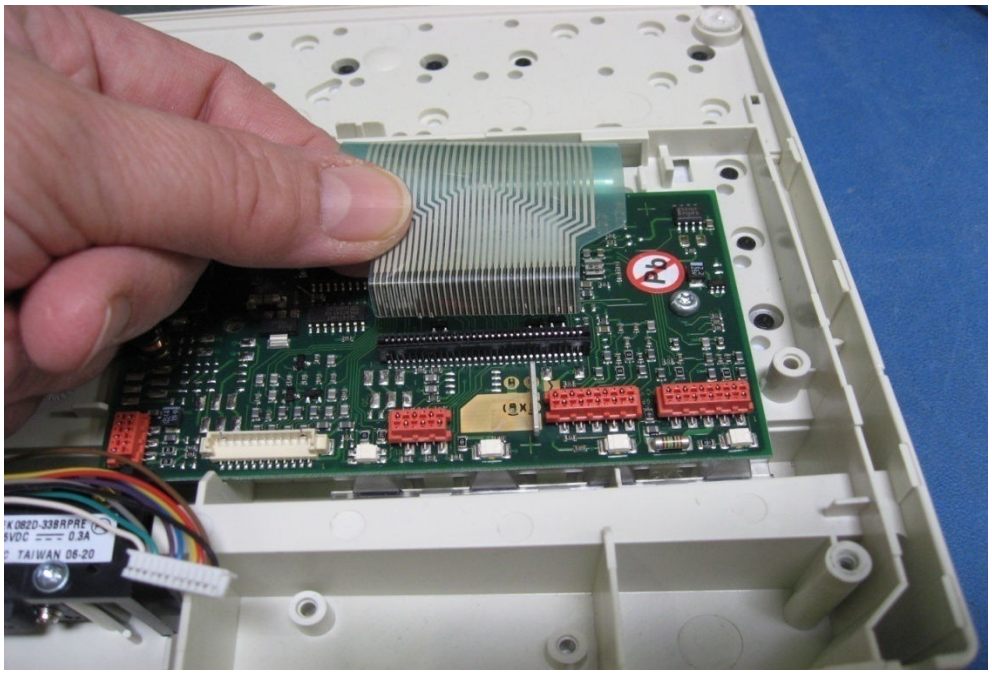
Evaluating and Replacing the Magnetic Strip Reader (MSR)

1) Test MSR with a 3 track MSR Testing card in Notepad or any word processing program. Repeat test several times in both directions.
    a. Initially it is advisable to test with the customers program installed then test with the test program.
        i. This helps to identify any programming errors and may account for the problem observed by the customer.
2) If MSR skips a track or does not slide smoothly, check to make sure it is free of debris and then swipe a MSR cleaning card through several times.
3) If MSR still has problem reading or does not respond at all it will probably need replacement.
4) Follow steps as noted previously (for replacing a keypad) on page 11.
5) Make sure MSR is aligned correctly for smooth operation.



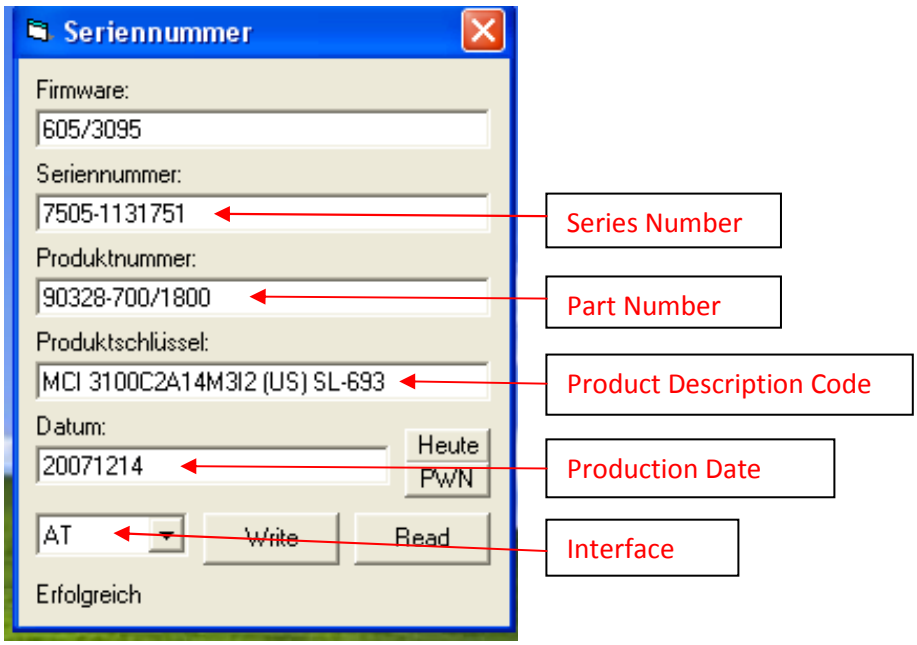
Evaluating and Replacing the Electronics

1) During the initial testing it was noted that continuous or flashing LED's can signify a need to update the firmware.
2) If after a firmware update and/or a keyboard reset the problem is still apparent it is probably necessary to replace the electronics board.
3) Always use the latest version firmware to flash the new electronics board on all repairs.
4) Follow steps as noted previously (for replacing a keypad) on page 11.
5) Install the new electronics board taking special care not to bend or damage the flextail when inserting.

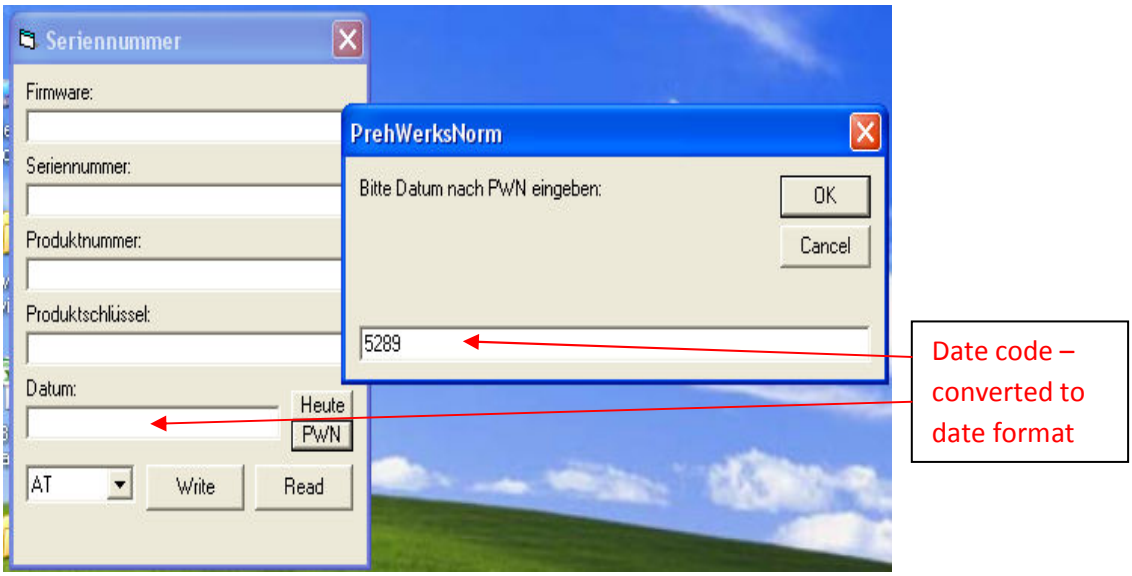


6) As part description, date code and series number is stored in the electronics, it is necessary to transfer or reenter this data whenever the electronics board is replaced.
    a. This information can be read out of the electronics and should be checked on all repairs to be sure parts are coded properly and no tampering has occurred.
7) To read data on functional electronics:
    a. Open Series Number program

b. Choose interface
c. Select Read



8) If the electronics need to be replaced and the information is not readable it is necessary to enter the correct data and then write it to the new electronics.
   a. Most of the data can be obtained from the label on the back of the keyboard.
   b. When entering the production date, select PWN and fill in the 4 digit date code from the first section of the serial number. It will be converted to the correct date.



9) The keyboard will perform best when the latest version of firmware is used.
    a. Whenever the electronics are replaced the latest firmware is used.
    b. The majority of keyboards returned for repair will require a firmware update.
        i. Determine what version of firmware is loaded on the unit returned and then update if needed using the Firmware Update Utility. Directions for use start on page 22.

Upgrading Firmware

Prior to upgrading the firmware, attach to the computer and read the firmware version with the WinProgrammer.

a. Select 'Help" then 'About' from the Menu bar or '?' from the toolbar
b. At the Information window select the proper interface and select Keyboard Version

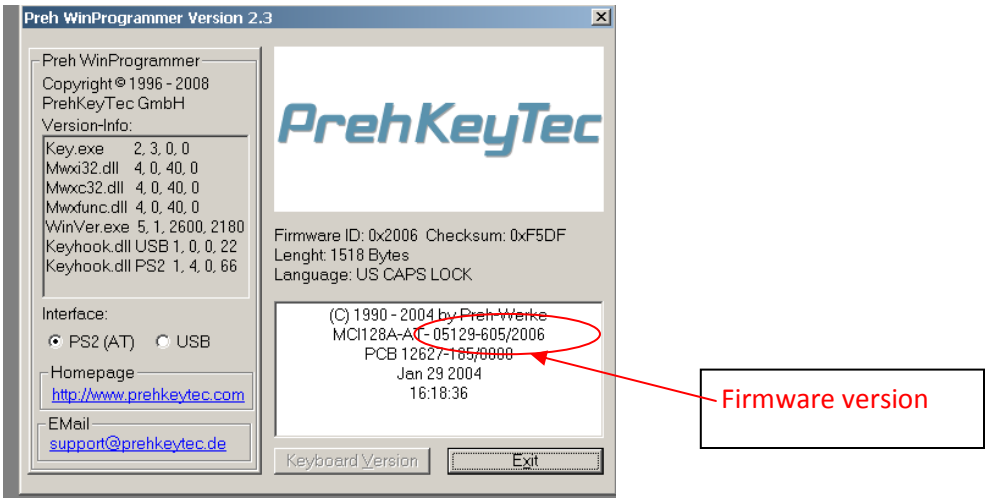


Figure 1

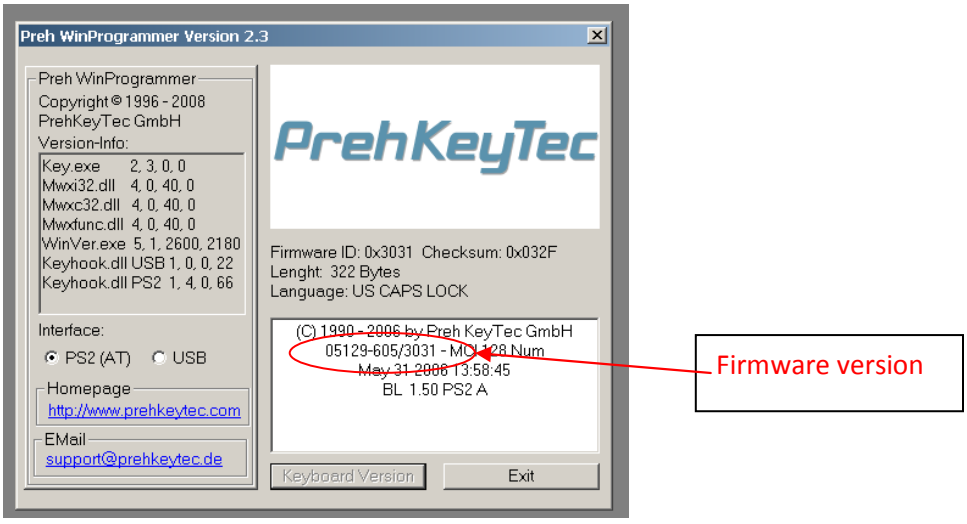


Figure 2

2) In order to update the firmware, the version must read 05129-605/3XXX. The example in Figure 1 cannot be updated without changing the electronics board.
3) The firmware in Figure 2 can be updated.
    a. Please note the BL 1.50 at the end of the information. This denotes that the Bootloader Update file has already been loaded and only the latest firmware file update is needed. More on this to follow.
4) Install the Firmware Update Utility (FwUpd) and follow the default settings
5) Copy the Bootloader Update and the firmware files into the same folder as the Firmware Update Utility program
    a. Program files/Preh/FirmwareUpdate Folder
6) When ready to update connect keyboard with USB cable.
    a. All update must be done on USB connection only. If keyboard has a PS2 cable either an appropriate adapter must be used or the unit opened and a USB cable attached for the update procedure.
7) If the boot loader has not been installed (see figure 2) it should be installed first before firmware is updated.
    a. Click on Open File and select Bootloader Update 1.51.S19
    b. Click Download

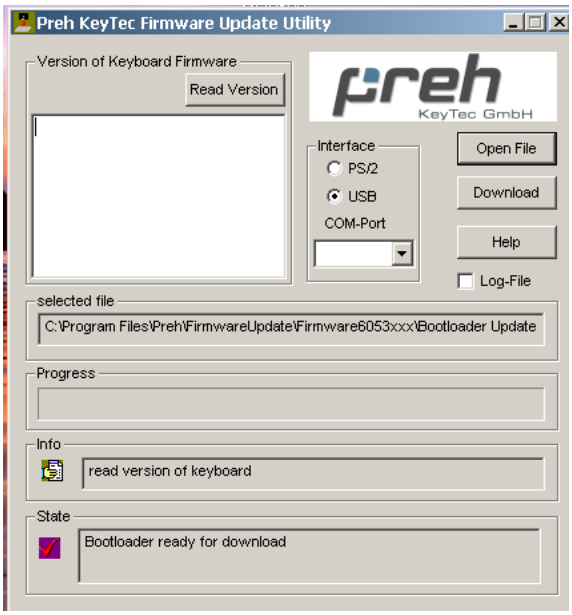


Figure 3

    c. Note Warning pop up window as in Figure 4. Click OK and allow download to proceed.

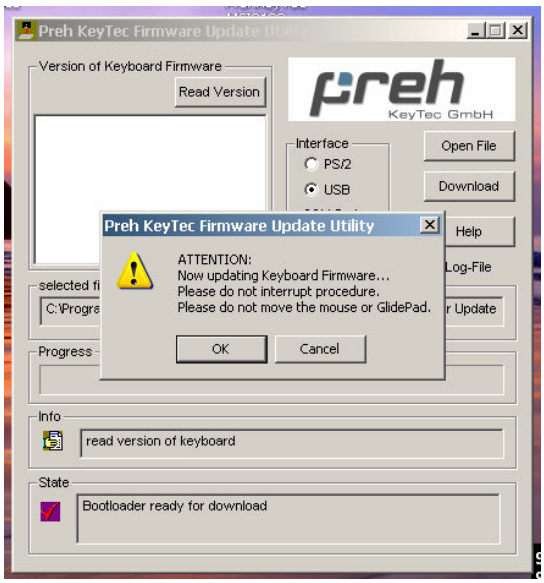


Figure 4

8) When down load is complete the Accept LED will continue to blink until the second firmware is updated.
9) Click Open File and select the appropriate firmware file for the keyboard to be updated. (MCI 128/ MCI 3100 etc.)
10) Follow same process as when downloading Bootloader. Be careful not to move the mouse or touch the keyboard during the download as noted in figure 5.

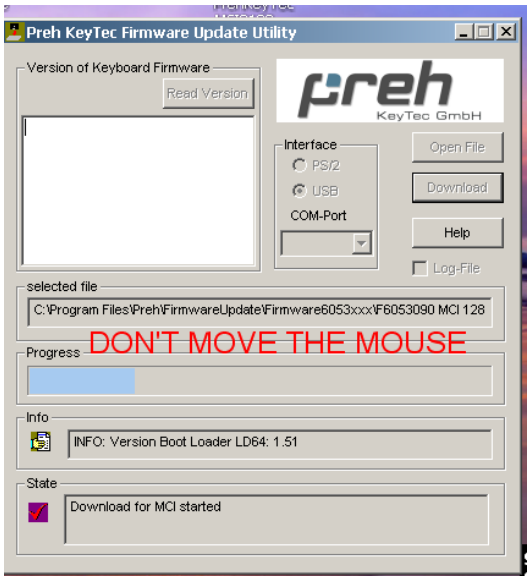


Figure 5

11) When download is complete the Accept LED should stop blinking and the Update can be checked by clicking on the Read Version button at the top of the Program window.
12) Reprogram the keyboard with the test or custom keyboard file as appropriate.

Completing the Repair Process

1) Although cleaning is not considered to be under warranty there are some cases when it should be done such as:
    a. When transferring dirty keys to a new keypad.
        i. Excessive dirt/spills can impair key performance and contribute to damaging the new keypad.
    b. As a service to promote good customer relations. A surface cleaning and replacement of lost feet or keycaps, whether under warranty or on repairs the customer is paying for, clearly improves product appearance and presents a positive example of good service.
2) When transferring keys from a defective keypad, it is easier to clean the keys before moving them. Any cleaner sprayed on the keys will not seep thru and damage the repaired unit.
    a. Blow out all loose dust/lint etc. with canned or compressed air.

    b. When keys are printed or laser etched, spray lightly with a mild general cleaning liquid such as “Cinch”.
        i. Do not spray liquid on keys with paper inserts. Simply wipe all keys with dampened Q-tip.
    c. Wipe between the rows and columns of keys with a Q-tip until clean and dry.
    d. Transfer keys.

3) When a unit needs cleaning and the keypad replaced was not replaced, be careful not to let any liquid seep into the keyboard.
    a. Use air to blow out loose debris.
        i. It may be necessary to remove some keys to clean correctly. Always use a key remover to avoid damaging the unit.

    b. Wipe housing with a damp cloth and a mild liquid cleaner.
    c. Wipe between the rows and columns of keys with a Q-tip until clean and dry.
4) Replace missing keys whenever possible.
5) Ideally it is a good idea to program the completed RMA with the custom program which was saved prior to testing.
    a. If the custom program is defective or unreadable then the default program should be installed.
6) Return unit in original box if provided or wrap securely in bubble wrap to avoid damage to keypad when returning to customer.