

PicoPromSD

User Manual

Version 1.0

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1. Introduction

This User Manual (UM) provides the information necessary for effective use of PicoPromSD.

1.1 Overview

The PicoPromSD was designed as a tool to backup and restore EEPROM data in the original Microsoft Xbox. Upon plugging in the PicoPromSD into the Xbox's LPC port, it will automatically backup the EEPROM data to inserted microSD card in the "EPBACKUP" folder. This only takes a second. If an "eeprom.bin" file is found in the "WRITEEP" folder, you will be given the option to write that file onto the EEPROM chip on the Xbox motherboard. Ensure you read over this entire manual before using your PicoPromSD for the first time.

2. Getting Started

2.1 Cautions & Warnings

This tool has the potential to damage your Xbox and turn it into a paperweight. If mishandled, it could corrupt your EEPROM which could cause the Xbox to no longer function. You take all the risks associated with using the PicoPromSD and no guarantees are made.

USE AT YOUR OWN RISK

2.2 Set-up Considerations

To use PicoPromSD, you will need a microSD card that is formatted with FAT32 filesystem. FAT16 should also work but not tested.

You will be required to disassemble your Xbox (not covered in the manual) to access the LPC port on your Xbox.

The easiest way to use PicoPromSD, is to have a 2x8 pin header soldered into the Xbox's LPC port. While this is not necessary, it will allow the safest and easiest connection. The LPC port does not have to be rebuilt for 1.6 versions of motherboards; however, if soldering a pin header onto the motherboard, it's recommended to go ahead with the rebuild for future use.

3. Using the System

The following sub-sections provide step-by-step instructions on how to use the various functions or features of the PicoPromSD. Figure 2 in this section will identify the LEDs mentioned in this section.

3.1 Backing up the EEPROM

Backing up the EEPROM is easy and requires very little from the user. This guide will assume your LPC port on your Xbox has a pin header installed as recommended in section 2.2.

1. Insert the FAT32/FAT16 formatted microSD card into the PicoPromSD
2. With the Xbox POWERED OFF and Power switch is on USB (to the right), place the PicoPromSD onto the pin header on the LPC port. Place it so that the microSD and button are on the right-hand side of the LPC port and are closer to the center of the Xbox's motherboard (see Figure 1).
3. Power on the Xbox.
 - a. After power is stable (if D0/LFrame is grounded, let the Xbox FRAG), Flip the power switch on the PicoPromSD to LPC.
 - b. When power is applied, you will see both the green and red LEDs light up. This means that the backup is in process.
 - c. After a second, the red LED will go out and the green will stay on. This means that the backup was successful. If the green LED goes out and red stays on, then there was an error. Check the microSD card and try again. If the problem persists, check the log written to the SD for possible errors. If no log has been written, then the SD card may be the issue.
4. Turn off power to your Xbox and flip the power switch to USB, then remove the PicoPromSD.
 - a. Your backup will be on the microSD card under the eepbackup folder. You can backup multiple times. Each backup name is incremented, so you can backup multiple systems without needing to change microSD card. (Backups are named the Xbox's Serial number or eeprom.bin (if serial number cannot be determined), subsequent backups of same system will append a 1,2,3, etc... to the file name.)
5. Backup is complete.

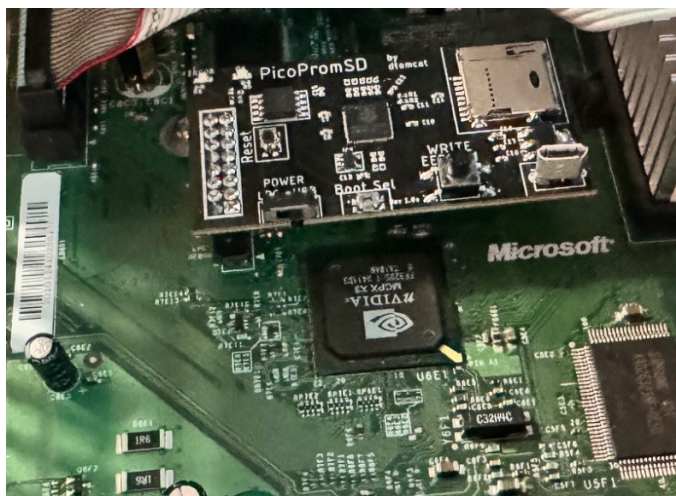


Figure 1.

3.2 Writing to the EEPROM

Writing to your EEPROM is a little bit more involved (on purpose). It's important to note that the PicoPromSD does not validate nor verify the eeprom.bin provided by you. If you provide a corrupt eeprom.bin, it will write the corrupt eeprom.bin and therefore... CORRUPT your EEPROM. Caution must be taken to ensure you provide a valid eeprom.bin.

Please note, that eeprom.bin file will be deleted from the "WRITEEEP" folder (discussed later). The eeprom.bin files inside the EPBACKUP folder will not be touched. Please ensure you have a backup of the eeprom.bin file you place in the "WRITEEEP" folder.

To write to your EEPROM:

1. On the microSD card you're using
 - a. Create a new folder in the root directory named "WRITEEEP"
 - b. Copy your eeprom.bin (that you validated and verified) into the "WRITEEEP" folder.
 - c. Now follow the instructions in section 3.1 through 3.1.3. Do not turn off the Xbox. After 3.1.3, return here.
2. After the backup, if the microSD card was prepared correctly, the PicoPromSD's green LED will flash rapidly. This informs you that it sees the eeprom.bin in the WRITEEEP folder and is ready to write the EEPROM.
 - a. CAUTION: the next part can kill your Xbox. Do not proceed unless you know what you are doing. This will overwrite your EEPROM with the data you provided. If that data is corrupt... so will your EEPROM. PROCEED AT YOUR OWN RISK.
3. When ready to Write, and the green LED is flashing rapidly, Press the "WRITE EEPROM" button on the PicoPromSD.
 - a. When complete, the green LED is will stay on solid, and the write process is complete. NOTE: The eeprom.bin file is now deleted from the "WRITEEEP" folder. This is to ensure you do not accidentally write that file to another Xbox.
4. Write Process is now complete.

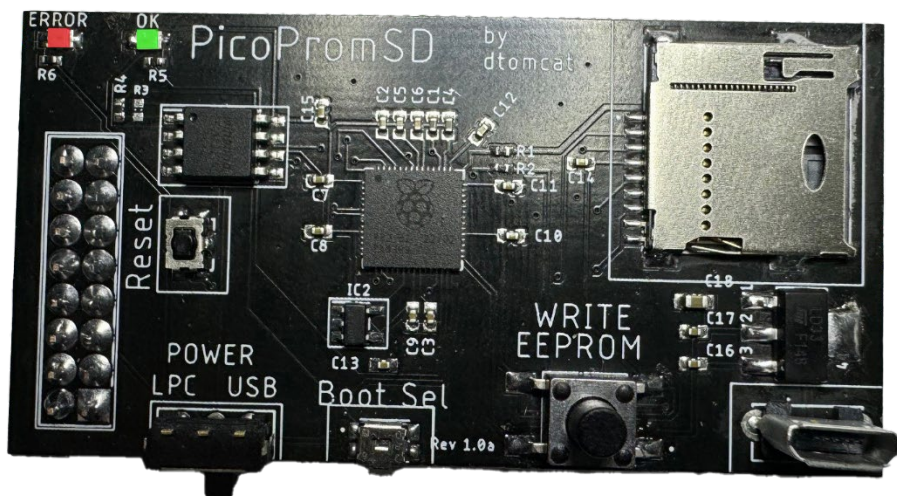


Figure 2.

3.3 Reading/Writing the EEPROM without a Pin Header

It is possible to read from and write to your EEPROM without a pin header installed on your Xbox. One example will be given in this section (pogo pins). While reading from your EEPROM with this method is relatively safe, it is not recommended for writing to your EEPROM. This method basically uses pressure to make the electrical connections between the PicoPromSD and Xbox LPC port as you press the pogo pins into place. Reading data from the EEPROM is relatively quick and, if done incorrectly, results in an error or a corrupted eeprom.bin stored to the SD card. Writing data to the EEPROM is relatively time-consuming and requires a very stable electrical connection by comparison. Failing to write the EEPROM correctly will permanently damage your xbox. If enough pressure can be exerted the entire time (while pressing the “write EEPROM” button and throughout the entire process) this method can be used for reading and writing. Again... This process isn't recommended for writing... and note the chance of your backup being corrupted as well.

3.3.1 Cautions with pogo pin method

CAUTIONS/WARNINGS:

1. If the pogo pins are not placed on the correct LPC port vias/pads, you can damage the PicoPromSD and/or your Xbox motherboard. Ensure proper placement. Damage can occur while the Xbox is powered OFF but plugged into a wall outlet.
2. Take care not to exert too much pressure on the pogo pins as damage to boards/pins can occur. Only enough force to compress the internal springs is needed.
3. Not exerting enough force will result in poor connection. During the reading stage... this can result in corrupted backup files. During the writing stage, this can cause damage to your Xbox resulting in the Xbox not being able to boot.
4. If the LPC appears dirty, You may need to clean the area to ensure a good electrical connection.

3.3.2 Making a Pogo Pin attachment

There are many ways to make a pogo pin attachment for the PicoPromSD. How you do so is up to you. There is a 3D model that can be printed to aid in this step.

You will need the following:

1. 1 3D printed part
2. 1 2x8 pin header
3. 5 Pogo pins (P75-E3 Spring Test Probe)
4. Soldering Iron/Solder

This requires soldering in small places. It is not recommended for those who are not comfortable with soldering. Heat and plastic do not mix! If you are not comfortable or careful, you will melt the plastic and may make the piece unusable.

3.3.2.1 Assembly Instructions

1. Insert pin header (use side with shorter pins) into 3D printed part. Use the side with square holes.
2. Insert pogo pins (end with smallest diameter) into opposite side of 3D printed part. Ensure the ends of pogo pins and pin header touch in the visible voids of 3D printed part.

3. With Pin header fully inserted and touch pogo pins, solder the point where pogo pins/pin header meet (all 5 locations). Take caution not to melt the plastic.
4. Attachment is ready for use. You can use a multimeter to ensure a good connection exists between pin header and pogo pins. (Figure 3 and 4) show a completed pogo pin attachment.
5. You'll insert the pin header side into the PicoPromSD. The side with the group of 3 pogo pins (right side of Figure 4) goes towards the side with the 2 LEDs (top of the board) and the side with single pin goes towards the side with power switch (can see 3 pins from power switch under LED Codes chart).

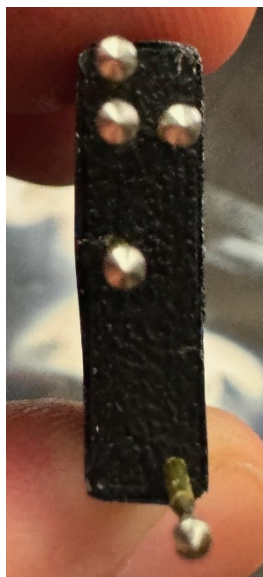


Figure 3

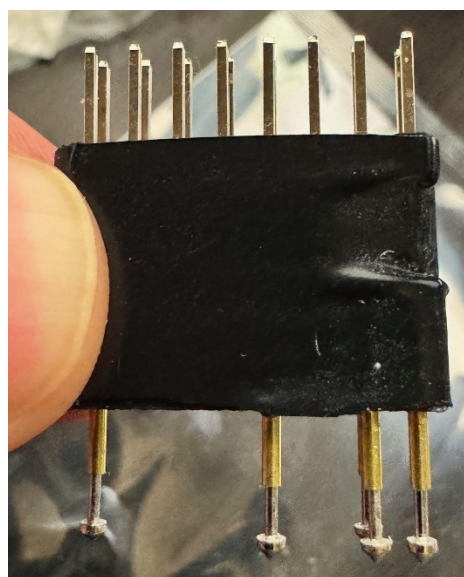


Figure 4

3.3.3 Using Pogo Pin attachment

Using the pogo pin attachment takes a little bit of finesse, but not too difficult. Refer to figure 5 for pin numbering for the LPC port. This section assumes the pogo pin attachment is already connected to the PicoPromSD (refer to 3.3.2.1.5).

WARNING: Improper placement may damage the Xbox motherboard and/or PicoPromSD. Ensure proper alignment before applying any pressure.

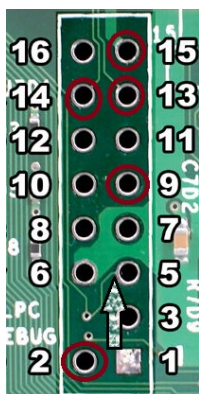


Figure 5

3.3.3.1 Steps of use

1. Ensure Xbox is powered off. (This is not necessary, but safest way)
2. Place the 2 parallel pogo pins on LPC pins 14 and 13 keeping the remaining two pins off LPC port.
3. Rotate PicoPromSD to allow remaining pins to contact LPC port pins 6 and 2.
4. Apply slight and even pressure ensure pogo pins compress (but not fully compress). This will ensure a good connection between PicoPromSD and Xbox.
5. Keep slight (and even) pressure throughout the remaining processes.
6. Follow steps for reading/writing as desired (sections 3.1/3.2 respectively).

A video of this in action can be seen here: <https://dtomc.at/PicoPromSDPogoPin>

3D Print files can be found here: <https://github.com/dtomcat/PicoPromSD>

3.4 Reading the Password from OG XBOX Seagate Drives

This section requires that you have updated your board to at least firmware 2.2 or higher. This will work with all OG Xbox Seagate drives (slim and rubber jacketed). This functionality will grab the hard drive's password (not HDD key like with EEPROM). This password can be used to unlock the drive using software like FatXplorer (<https://fatexplorer.eaton-works.com>).

3.4.1 Required Items

1. 3 wires (or self made adapter) each with a male end and a female end
2. OG Xbox Seagate Hard Drive
3. PicoPromSD (Firmware 2.2 or higher)

3.4.2 Connections

Connect the 3 wires using figures 6 and 7. You'll connect the TX's together, RX's together, and GND's together. NOTE: These are not the pin names for each device! They are labelled this way to eliminate confusion. Do NOT apply power to either device while connecting them together.

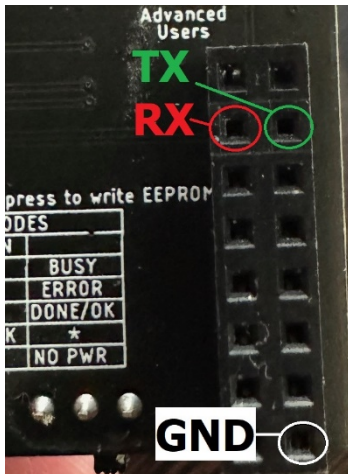


Figure 6

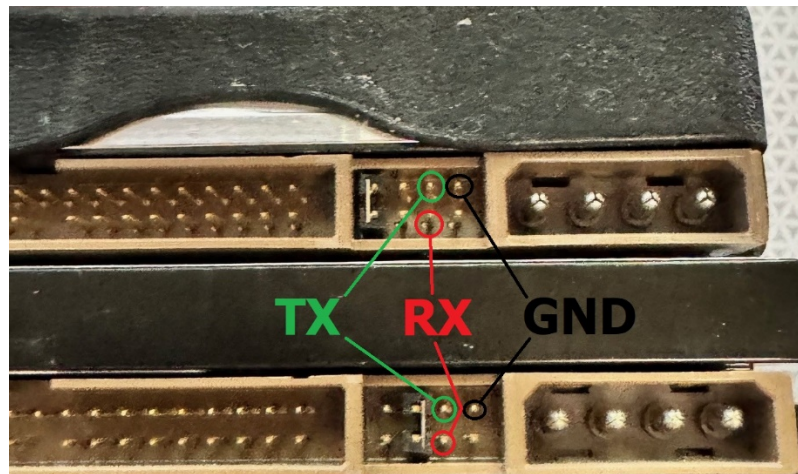


Figure 7

3.4.3 Getting the Password

WARNING: Ensure both the HDD and picoPromSD are powered off.

1. Ensure that picoPromSD and HDD are powered off
2. Connect wires in accordance with section 3.4.2
3. Hold the “WRITE EEPROM” button on the picoPromSD
4. Apply power to picoPromSD while continuing to hold “WRITE EEPROM”
 - a. Power will come from USB port for this section. You can use USB connected to a computer, power brick, or battery pack.
5. You will see the Red and Green LEDs alternating; indicating you are in HDD password mode. (you can release the “WRITE EEPROM” button at this time)
6. Wait until the Green LED remains on steadily
 - a. This indicates that the picoPromSD is ready for the HDD to be powered on
7. Apply power to the HDD
 - a. You will see both red and green LEDs light up and remain on; indicating that the picoPromSD is communicating with the HDD
8. Wait for the Red LED to turn off and Green remain on. This indicates that the process is complete
 - a. If Green LED turns off and Red LED remains on... This indicates an Error occurred. You can try again from step 1
9. Turn off power to both the picoPromSD and the HDD
 - a. All data from the process will be stored on microSD card under “HDDPass” folder

3.5 Unlocking OG XBOX Seagate Drives

This section requires that you have updated your board to at least firmware 3.0 or higher. This will work with all OG Xbox Seagate drives (slim and rubber jacketed). This functionality will unlock the hard drive.

WARNING: This will nuke the password (set to all zeros) for the Slim version. The process will back up the password... but it will then be nuked.

For Rubber Jacket drives, the drive is set to an unlocked state and the password is unaffected.

3.5.1 Required Items

1. 3 wires (or self made adapter) each with a male end and a female end
2. OG Xbox Seagate Hard Drive
3. PicoPromSD (Firmware 3.0 or higher)

3.5.2 Connections

Connect the 3 wires using figures 6 and 7 above. You'll connect the TX's together, RX's together, and GND's together. NOTE: These are not the pin names for each device! They are labelled this way to eliminate confusion. Do NOT apply power to either device while connecting them together.

3.5.3 Unlocking the drive

WARNING: Ensure both the HDD and picoPromSD are powered off.

1. Ensure that picoPromSD and HDD are powered off
2. Connect wires in accordance with section 3.5.2
3. Hold the "WRITE EEPROM" button on the picoPromSD
4. Apply power to picoPromSD while continuing to hold "WRITE EEPROM"
 - a. Power will come from USB port for this section. You can use USB connected to a computer, power brick, or battery pack.
5. You will see the Red and Green LEDs alternating; indicating you are in HDD password mode.
 - a. Keep holding the "WRITE EEPROM" button until the LEDs start alternating faster.
 - b. You can then release the "WRITE EEPROM" button and the PicoPromSD is now in HDD unlock mode.
6. Wait until the Green LED remains on steadily
 - a. This indicates that the picoPromSD is ready for the HDD to be powered on
7. Apply power to the HDD
 - a. You will see both red and green LEDs light up and remain on; indicating that the picoPromSD is communicating with the HDD
8. Wait for the Red LED to turn off and Green remain on. This indicates that the process is complete
 - a. If Green LED turns off and Red LED remains on... This indicates an Error occurred. You can try again from step 1
9. Turn off power to both the picoPromSD and the HDD
 - a. All data from the process will be stored on microSD card under "HDDPass" folder
 - b. The HDD should now be unlocked.

4. Upgrading the Firmware

The following sub-sections provide step-by-step instructions on how to upgrade the firmware of the PicoPromSD.

4.1.1 Where to get the Firmware

The firmware will be hosted on my GitHub repository. The firmware will be listed as a UF2 file. Download this file and save it for later use. The current firmware as of this manual is 2.2.

GitHub link: <https://www.github.com/dtomcat/picoPromSD> Firmware folder can be found [here](#)

4.1.2 Upgrading the Firmware

Ensure you grabbed the firmware file from section 4.1.1.

1. Remove picoPromSD from the Xbox if connected and remove any USB cords connected
2. Slide the power switch on picoPromSD to the “LPC” side
 - a. This ensures no power will be applied to the picoPromSD prematurely
3. Plug the micro USB cable into the picoPromSD and connect to your Computer
4. Hold the “Boot Sel” button
5. While continuing to hold the “Boot Sel” button, Slide the power switch to “USB”
 - a. You should see a folder pop up (windows) with two files in it:
 - i. INDEX.HTM
 - ii. INFO_UF2.TXT
6. Place the UF2 file you downloaded in section 4.1.1 into this folder that popped up.
 - a. If no folder popped up, you may have to open it manually depending on the settings in windows.
7. After the file uploads, the picoPromSD will automatically reboot
8. Congratulations... Your picoPromSD's firmware has been updated.