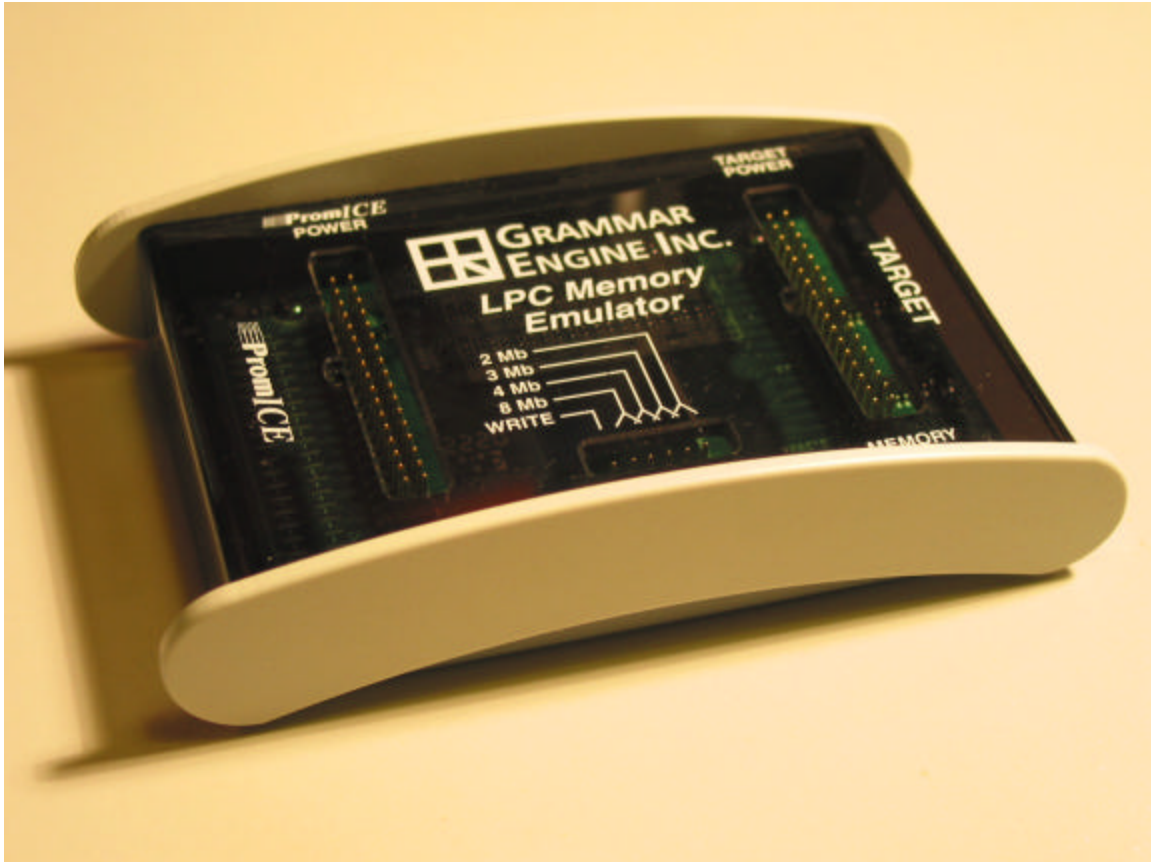


# LPC/FWH Adapter

## Low Pin Count and Firm Ware Hub Adapter for the PromICE



### User Manual

Version 1.a

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MG Tech.

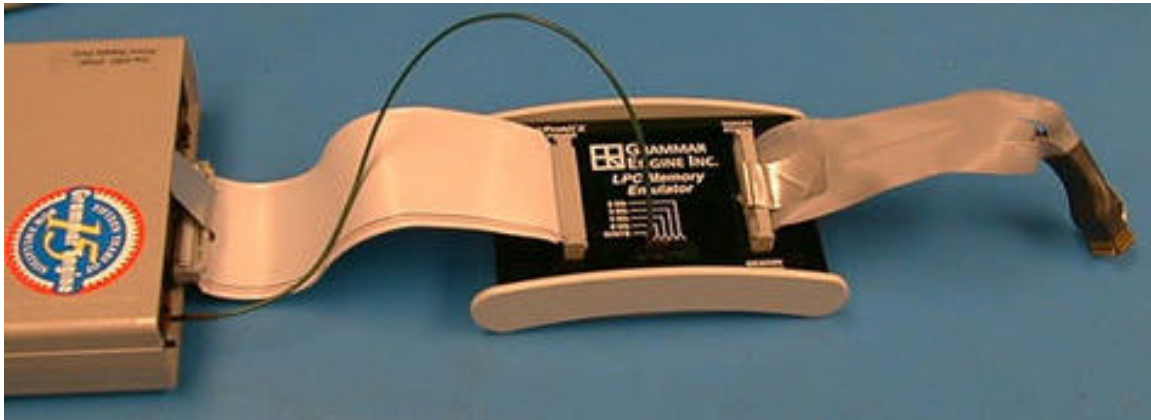
[www.promice.com](http://www.promice.com)

614.899.7754

LPC emulator is a 3.3-volt adapter as well as the **Low Pin Count** or the **Firm Ware Hub BIOS** chip emulator adapter for the PromICE. The PromICE memory emulator is a 5 Volt device.

#### **Connection to the PromICE memory emulator:**

The LPC emulator attaches to the PromICE via a flat-ribbon cable. This cable is shielded and has IDC-34 female connectors at either end. The cable is also keyed with the connectors so that shield is connected to the ground.



The LPC emulator system

The PromICE powers the LPC emulator. Therefore make sure that the POWER selection jumpers on the back of the PromICE on the right hand side are set to: **32, ROM, EXT.** This allows the PromICE power to be routed out the back 34-IDC connectors to the LPC emulator.

#### **Connection to the target (motherboard etc.);**

You attach the LPC emulator to the target system, the motherboard via the PLCC-32 cable. This is a gray unshielded cable with PLCC plug at one end and IDC-34 female socket on the other end. The PLCC end has pin-1 marked with a white dot (paint mark). When inserting it into the target socket please make sure that the dot goes to the socket pin-1, which is the side that has a flat corner. All the other corners are right angle.

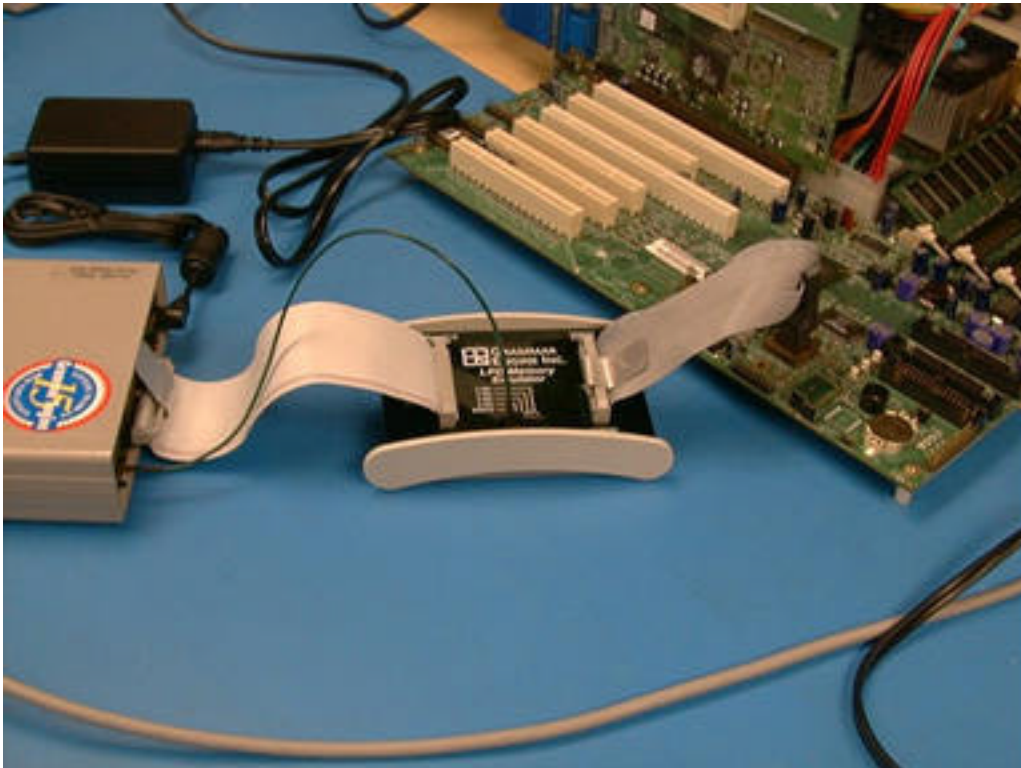
There are no other connections to the target. If your motherboard has the BIOS chip soldered on then you will have to first have the chip replaced with a PLCC-32 socket.

#### **LED Indicators:**

There are three LEDs in the LPC case. One labeled **PromICE POWER** will light up whenever the LPC emulator is attached to the PromICE and the PromICE is powered up.

You should always have PromICE (and hence the LPC emulator) powered up before applying target power, i.e. before powering the motherboard.

The second LED is labeled `TARGET POWER` and will be lit up whenever the target power is on. The third LED is labeled `MEMORY ACTIVITY`. This LED will blink at varying rate depending on the target accessing the PromICE memory via the LPC socket. Normally it will blink about once a second or so and will blink rapidly when an access is made via the LPC bus. *If this LED is blinking at all that means the LPC emulator sees the PCI Clock coming in.* The clock runs a counter that blinks the LED.



The LPC emulator connector to the target

### Write Line:

You can also attach a write line to the PromICE. This allows the target writes to the emulated device to go through to the PromICE. The write line is connected from the pin marked `WRITE` on the LPC emulator to the `mwr` pin on the back of the PromICE on the left hand side. There are two `mwr` pins and one `swr` pin on the back of the PromICE. One pair of `mwr/swr` is jumpered together internally. These are 8-bit writes for the lower and the upper modules of the PromICE. Generally your LPC emulator is programmed to provide a single write line to connect to both `mwr` and `swr`.

**Selecting Proper device to emulate:**

If your LPC emulator is programmed for multiple devices then you should select the device by putting a jumper on 2, 3, 4 or 8 Mb position. The sticker on the back of the emulator will tell you what position is programmed for what device type.

**Using LoadICE Application to Load the BIOS image:**

It is best to use the command line LoadICE to load the BIOS image to the PromICE. Here are a couple of examples of loadice.ini files that were used on the AMD and Intel mother boards.

For AMD SOLO mother board using a Winbond 2Mb LPC chip.

```
pponly lpt1
rom 256k
image solo.bin
```

For Intel D845PEBT2 mother board using a Intel N82802AB FWH chip.

```
pponly lpt1
word 8
rom 27040
image=pebt2.bin
```

Here is a typical LoadICE session:

```
C:\LoadICE\LPC>loadice
LoadICE version 4.2c for Windows NT
(C) Copyright 1989-2001 Grammar Engine Inc.
Opening initialization file 'loadice.ini'
Connecting.. Please WAIT..
Opening Parallel Device PromICE
Connecting to PromICE via the Parallel Port..
Connection established
EMULATION UNITS PRESENT:
PromICE ID=0 Memory=512KBytes Emulating=256KBytes FillChar=0xFF Master/AI2
Opening file `solo.bin` for processing...../Done
Transferred 262144 (0x40000) data bytes

LoadICE Exiting with NO Errors

C:\LoadICE\LPC>
```

## Reprogramming the LPC Emulator

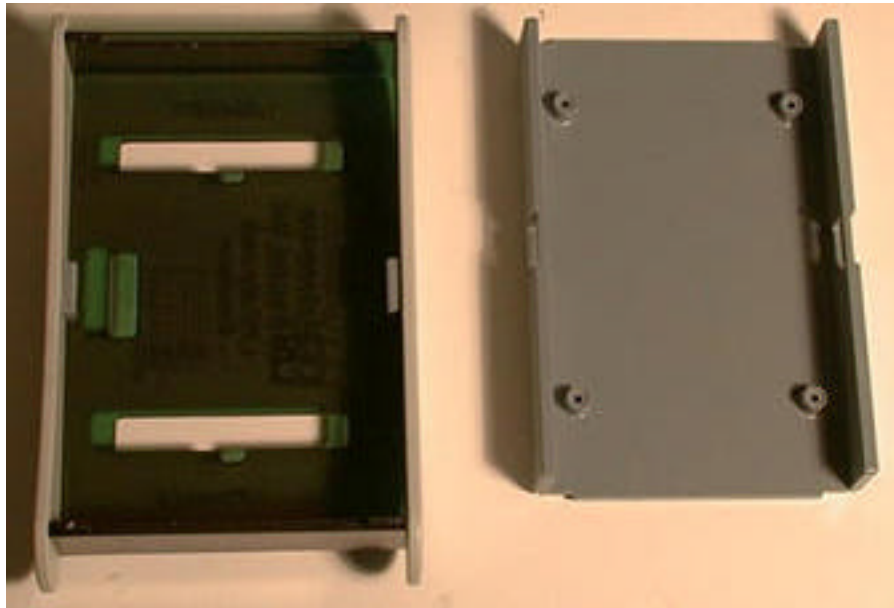
### Why?

A particular LPC emulator is programmed for one or more related chips. The chips differ in the types of bus cycles and the software command structure. In general there are two types of bus cycles. We call them FWH like and LPC like. Then there are two different command structures (CUI). The AMD like that require unlock sequences and the Intel like that require only direct writes of commands. Then there are some internal differences. Sometimes you may want to reprogram the emulator to emulate specific chips. The other thing to keep in mind is that the original LPC emulator was developed with the help of AMD and was tested on three separate motherboards. To the best of my knowledge there was never an exhaustive test done on the full functionality of the emulator. Most users (targets) simply do READ cycles. So that can be another reason to reprogram the emulator, to try to make a feature work correctly.

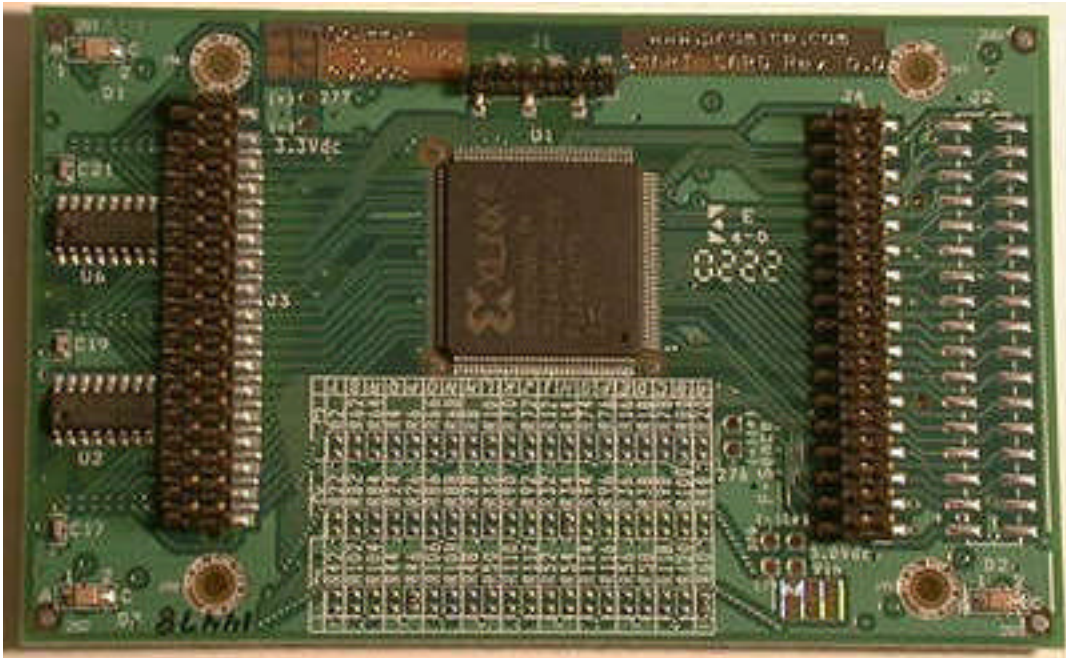
### How?

Your LPC emulator is programmed with a VHDL file compiled under Xilinx ISE 4 (or 6.1.03). You may optionally reprogram it using the ISE and the programming header on the LPC emulator PCB. The PCB is called the SmartCard. You may request a ZIP project file for the particular device programmed in your LPC emulator, call tech support or e-mail to [support@gei.com](mailto:support@gei.com). You will have to disassemble the LPC case to access the programming header, located underneath the PCB.

### Instructions for disassembling the LPC emulator



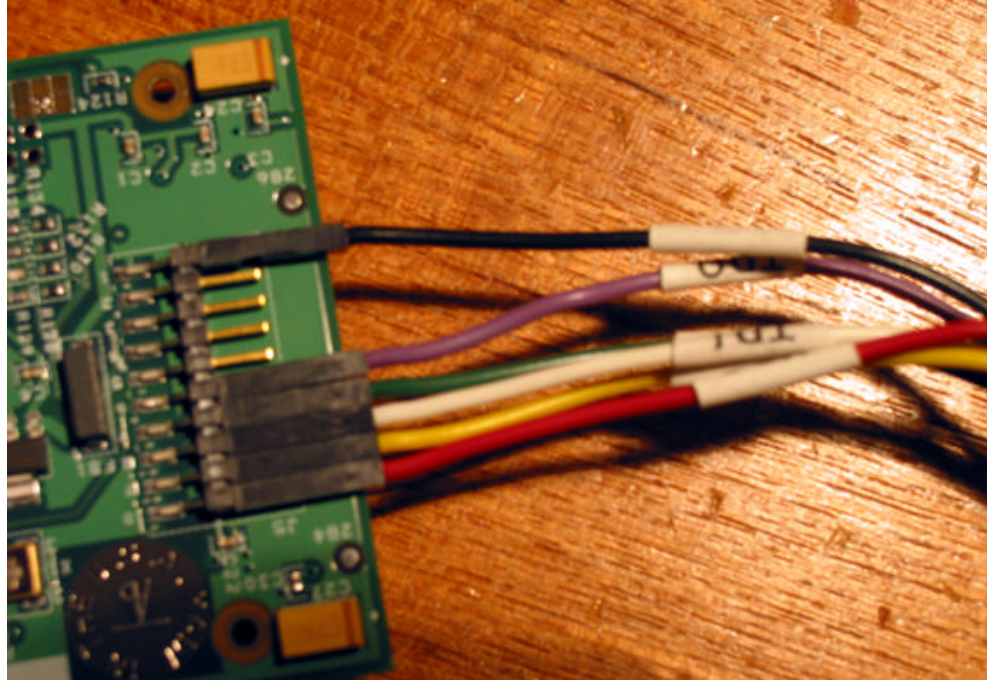
1. The LPC case is snapped together along the long edge on both sides. The first thing to do is to take it apart without breaking the case.
2. Place the box on its long side and gently insert a small flat tip screwdriver in the middle of the box and tip the screwdriver to release the bottom somewhat.
3. Repeat the process on the other side and with hand remove the bottom.



Top View of the smart card

4. Now remove the four screws holding the SmartCard from the box.





5. You must attach the SmartCard to a power source. Attach it to the back of the PromICE with one of the IPD-34 flat ribbon cable.
6. Power up the PromICE and the green LED on the SmartCard will go on.
7. Program the device with new stuff from the ISE.

### **Instructions for assembling the LPC case.**

1. Use the four screws and screw in the SmartCard to the base of the box. It can only go one way and stay within the base.
2. Place the top of the box with cutouts lined with the header. Don't snap the top or it will break.
3. Tip the whole assembly on the long side and gently press the base and slide it in somewhat.
4. Do the same thing to the other long side.
5. Now place the whole box on a flat surface and gently push the top till it snaps in.
6. The LPC emulator is now ready!

**List of LPC and/or FWH chips emulated:**

<u>Manufacturer</u>	<u>Part Number</u>
Intel	N82802AB/AC
Winbond	W49V002A
SST	SST49LF0[2,4,8]0A
SST	SST49LF00[2,3,4,8]A
SST	SST49LF004B
Atmel	AT49LW080
Atmel	AT49LL0[4,8]A
PMC	PM49LF00[4,8]A
SHARP	LHF00L03
ST Micro	M50FW016

#end