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## Developer Application Note: Using the MiniTerm as a Serial LCD



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Manual Last Updated March 5, 2008

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LCD Smartie is a free open-source LCD program. Its home page is:  
<http://lcdsmartie.sourceforge.net/>

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## Introduction

Serial LCD applications such as LCD Smartie, Pertelian, LCDproc, LCD4Linux, LCDC, LCD Studio, LCD Hype and many more are becoming very popular. They add extra computer I/O in an attractive form factor that allows the PC user to monitor and control numerous parameters without using valuable screen or keyboard real estate. Common functions include:

- Monitoring and controlling multimedia (volume, track lists, etc.)
- Monitoring and controlling PC voltages, fan speeds, etc.
- Following stock quotes, eBay auctions and headlines.
- Visualizing network performance and disk I/O.
- Home automation and security status and control.
- Weather, world clock, timers and stopwatches.
- Online collaboration and gaming.
- Monitoring multiple webmail accounts for new mail.

The Genovation MiniTerm family is ideally suited to this application. A MiniTerm can be connected to a PC using RS232, USB or Ethernet. They contain 12 to 20 keys, a buzzer and LCD in an attractive desk-top format. Some models contain LEDs and optional card readers.

This objective of this document is to demonstrate how to set up a MiniTerm v4.20 or later with LCD Smartie. The same techniques can be extended to other software packages. Additional tips are included for other software packages.



## Configuring the MiniTerm

First the MiniTerm must be connected to the PC and tested for correct operation. Follow the process described in the documents included with the MiniTerm and make sure your MiniTerm is operational. **Make a note of the COM port and baud rate settings you use.** Do not proceed with LCD Smartie until you have tested your MiniTerm.

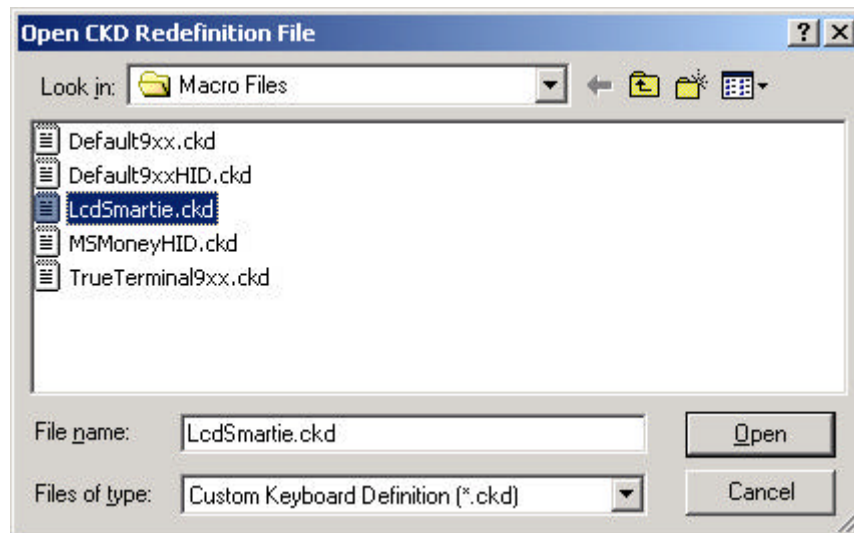
Once the MiniTerm is operational, then it can be configured to work with LCD Smartie. Depending on the MiniTerm model, the following aspects of the MiniTerm can control LCD Smartie or can be controlled by LCD Smartie:

- The LCD
- The LEDs
- The buzzer
- The keypad keys

The MiniTerm needs to be configured in the following way:

Parameter To Set	Setting to Use
Operating Mode	True Terminal
Green LED	Under Host Control
Red LED	Under Host Control
Key codes	One ASCII code per key

The buzzer does not require any specific configuration. A suitable configuration file, LCDSmartie.CKD, is located in the Macro Files directory.



Download this configuration file to the MiniTerm.

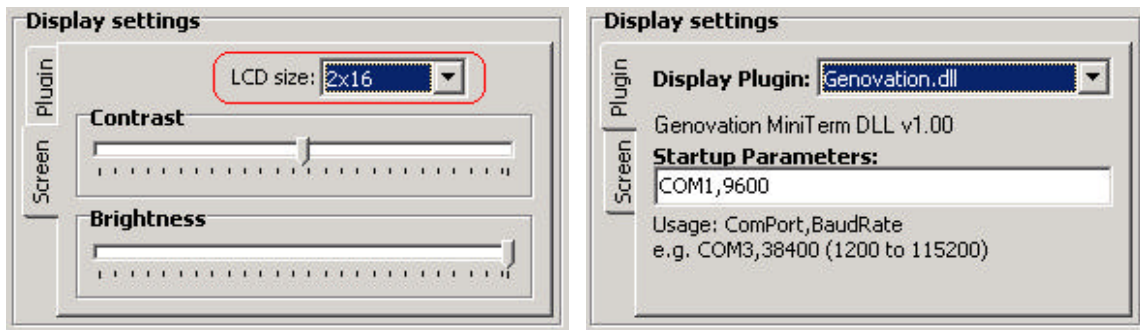
## Configuring LCD Smartie

Download and install LCD Smartie. The home page for the software is:

<http://lcdsmartie.sourceforge.net/>

You will also need the Genovation.DLL display plug-in/driver. This file can be obtained from either the LCD Smartie forum or from Genovation. It should be placed in the LCD Smartie “displays” directory.

Once you have installed everything start (or restart) LCD Smartie. Select the LCD size and Display Plugin. Set the COM port parameters to match you MiniTerm installation. Do not use any spaces in the Startup Parameters box.



## Using LCD Smartie

*This section assumes you have some familiarity with LCD Smartie. You should invest some time learning the capabilities and operation of the package.*

The MiniTerm buzzer is accessed via GPO4. For example, to announce new mail using the buzzer setup the following actions.

Screens	Actions	Startup/Shutdown
\$Email1	> 0	then GPOFlash(4,5)

This assumes you have correctly configured your email account. The action above will beep the buzzer 5 times.

The LEDs are accessed via GPO5 and GPO6. In a similar manner to the buzzer, you can turn an LED on, turn an LED off or flash an LED in response to some system condition.

Custom (user defined) characters can be created to suit almost any purpose, but there are some rules you need to be aware of. First, there are only 8 “slots” for custom characters so you can only create 8 different character bitmaps at once. Second, any screen that uses custom characters should create them in that screen. This is to avoid the built in behavior of LCD Smartie that is to overwrite them any time the screen changes.

The characters, once defined, are displayed through the traditional LCD Smartie ASCII character locations 176, 158, 131, 132, 133, 134, 135 and 136 (decimal).

Here is an example that shows the Microsoft Windows logo (courtesy of Rafael from the LCD Smartie forum). The result is shown on the front page of this document.

Line 1:

```
$CustomChar(1,0,1,0,0,1,0,0,1)$CustomChar(2,0,0,1,21,4,1,21,5)$CustomChar(3,7,25,25,17,17,17,23,31)$CustomChar(4,28,31,19,17,17,17,29,31)$Chr(176)$Chr(158)$Chr(131)$Chr(132)
Microsoft
```

Line 2:

```
$CustomChar(5,0,1,0,0,1,0,0,0)$CustomChar(6,20,5,1,21,4,1,21,4)$CustomChar(7,17,17,23,31,31,16,0,0)$CustomChar(8,17,17,29,31,3,0,0,0)$Chr(133)$Chr(134)$Chr(135)$Chr(136) Windows
```

### **NOTE:**

**The MiniTerm (v4.20 and higher) will also work with the standard HD44780S.DLL display plug-in. This may give some insight into other applications that will work with the MiniTerm. Examples of this compatibility is shown next two sections of this document.**

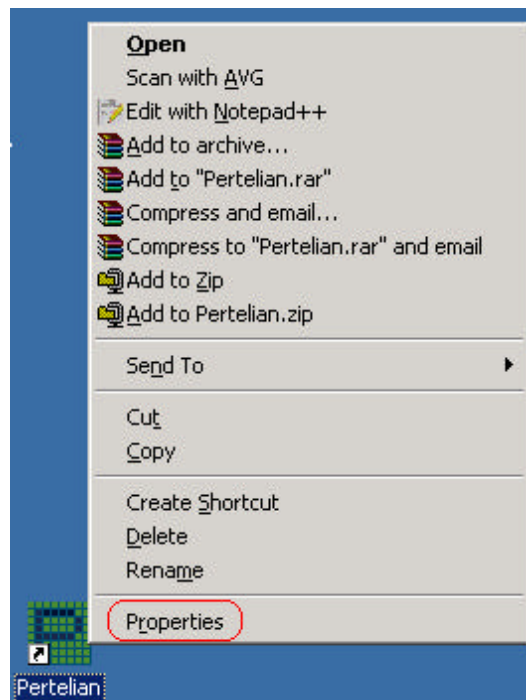
## **The FEh Compatibility Command Set**

The MiniTerm also supports an alternate command set tailored to only the LCD. This command set is sometimes called “FEh” which refers to the command byte itself. In this mode data sent to the MiniTerm goes to the LCD data register as human readable text except if the byte 0xFE precedes it, then the byte goes to the LCD control register. Some examples of where you will find this command set in use are any software designed to work with the EDE-702 chip, the Pertelian software and many more. The MiniTerm will auto-detect the 0xFE and will switch modes automatically. You should avoid using the @ command set in combination with the FEh command set. If you need to display an @ symbol, use ASCII character 0xA0 instead of 0x40.

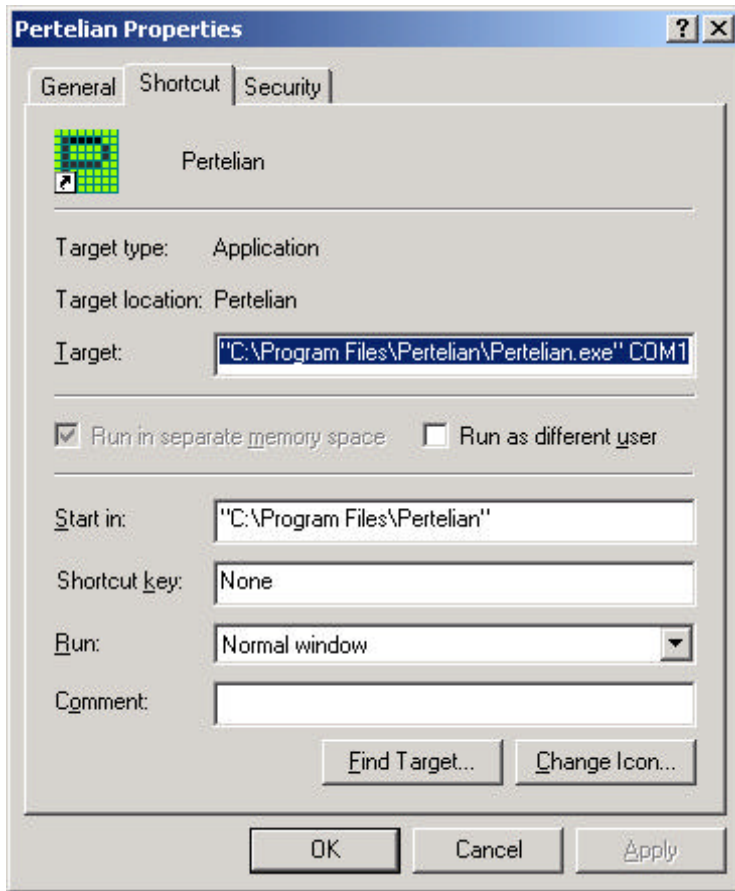
## Using the MiniTerm with Pertelian v5

The Pertelian software is supplied free of charge from ForeSight Systems LLC and is intended for their LCD display. It's a very nice software package and works well with their hardware. It can also be coaxed to work with a MiniTerm quite easily. **This example serves to illustrate that the MiniTerm's command set allows it to operate with a wide variety of existing software.**

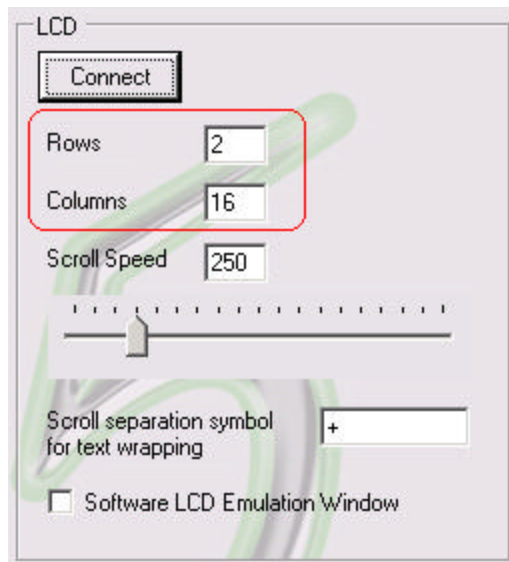
Download and install the Pertelian package. Once installed there are only a few adjustments that need to be made to use the MiniTerm with this software. First you will need to set the COM port to the one that your MiniTerm is connected to. This is done by right clicking on the Pertelian shortcut and clicking on Properties.



Then set the COM port in the shortcut line as shown next.



Finally adjust the LCD size on the main Pertelian setup form.



That's it! You're good to go.