# Sharp ECR Application Note



## Using a MiniTerm with a Sharp Electronic Cash Register

This application note describes a scenario where a corporate or student ID card can be used in conjunction with a PIN number to create a cashless point-of-sale environment for a campus cafeteria.  The ID card or tag may contain a barcode, a magnetic stripe or it may be of RFID type.  The ID number is combined with a user PIN in order to create a unique look-up number (also known as a positive number or account number) in the cash register for the individual or department.

**Preface**

It is assumed that the system integrator is knowledgeable with regard to the ECR and can perform the following duties:

- o Configure the ECR to work with an external card reader.
- o Add look-up values (Positive #'s) to the cash register.

It is further recommended that the system integrator spend a little time reading the MiniTerm documentation and experimenting with the unit.

*Please contact Genovation by email for the required ROM files. Genovation can assist you with the cabling required to connect your MiniTerm to your electronic cash register.*

**Objective**

The objective is simple: combine a card ID number with a PIN number to create a positive number for the cash register:

$$Card\ \#\ +\ Pin\ \#\ =\ Positive\ \#$$

To do this, a Miniterm 9xx with an installed card reader is setup in a mode that prompts the customer to swipe a card, and then enter a PIN.
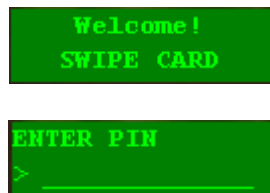




**MiniTerm Setup on a Windows PC**

These first steps demonstrate how to install the MiniTerm software on a PC and download the sample MiniTerm configuration file. The later information explains how to erase the MiniTerm back to factory and how to setup the MiniTerm for other situations.
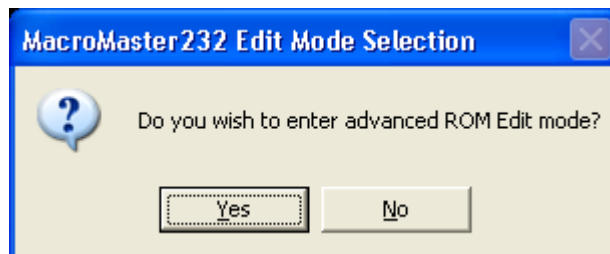
Installation Example: Sharp UP-3500

1. **Install the Genovation MiniTermPro software on a Windows PC.** Make sure you choose the install that includes the programming tools.

> NORMAL Installation ... Essentials and Programming Tools

This will install the editing tool (MacroMaster232,exe), the downloader (RSLoad.exe), the manuals and some additional test programs and utilities. The user manual is called MiniTermPro.pdf and you will also need to review MiniTermProAdvanced.pdf since the advanced features are used for the ECR modes.

*If you use a USB cable to talk to the MiniTerm from the PC, consult the regular user manual -- you will need to configure a virtual COM port. The rest of this document assumes an RS232 link between the PC and the MiniTerm.*

2. Hookup the MiniTerm (E.g. 905B) to the PC using a **Sharp Serial** cable (`part number 6RJ-Serial-Sharp`) and the 5v power adapter. Run MacroMaster in **Advanced Mode**. There is a description in MiniTermProAdvanced.pdf about launching methods, but the short story is that this is a hidden mode. **Hold the Ctrl key down while clicking on MacroMaster** from either the system tray icon or from Start > Programs > Genovation > MiniTermPro, etc. You should see something like:

> **MacroMaster232 Edit Mode Selection**
>
> ❓ Do you wish to enter advanced ROM Edit mode?
>
> [ Yes ]      [ No ]

Choose **Yes**. Note that this dialog may be sent to the back if you have a bunch of windows open. Minimize your other windows if necessary.

3. Tell MacroMaster what port the MiniTerm is on. Click **Set Port** and follow the instructions. You should end up with something like this:

> Set Port   Download   Test
>
> **Port: COM1 (DB9)**
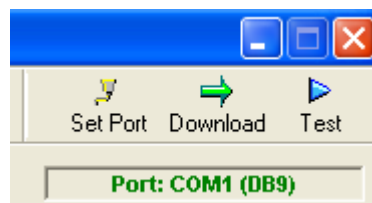
4. In MacroMaster, **open the ROM** file **ECR_SharpUP3500.rom** that you requested by email. Ideally you should keep this file in

C:\Program Files\Genovation\MiniTermPro\Macro Files

since that is the default directory for user files.  Download this to the MiniTerm by clicking Download.   This will launch RSLoad to send the file to the MiniTerm.   RSLoad will close by itself if it is successful.   You can close MacroMaster as your MiniTerm is now ready to talk to the UP-3500.

The next section in this document describes what this ROM file does.

## MacroMaster for ECRs

This is a quick and dirty explanation of how to make the MiniTerm work with the ECR.  The objective is to create a two-screen prompt so that the user swipes their card and enters a PIN.  The PIN is appended to the card data and sent to the ECR.  The user should see

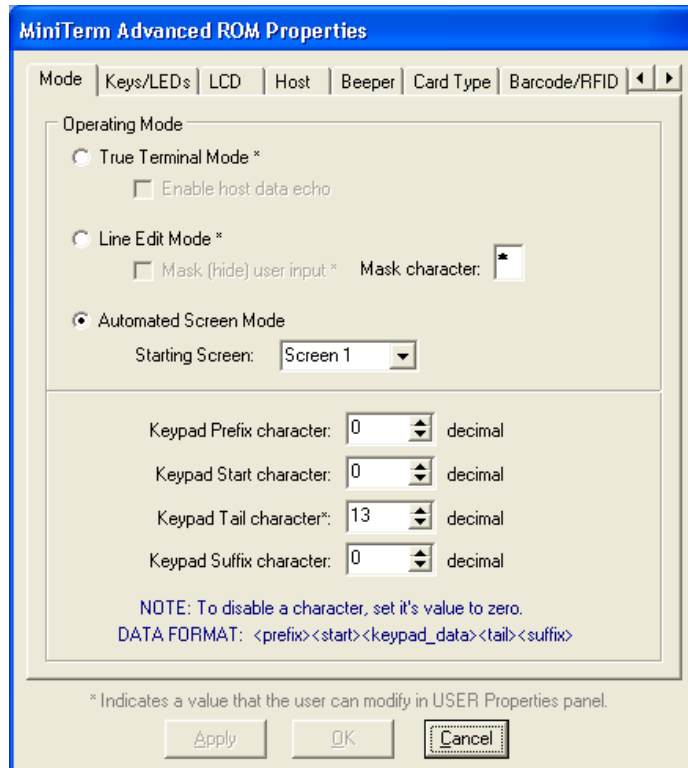Welcome! SWIPE CARD followed by ENTER PIN >_____

after the card is swiped.  You can change the text on these screens if you desire, but not their order.  Several things must happen to the data in order for the ECR to accept it.   Here are some sample data rules:

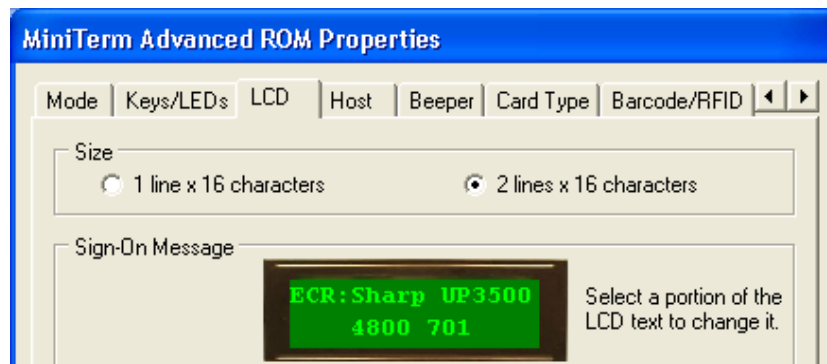| ECR | Communication | Packet |
|---|---|---|
| UP-600 | 9600, 7O1* | <stx> A00 <card_data> <pin_no> <cr> |
| UP-3500 | 4800, 7O1* | <stx> *00 <card_data> <pin_no> <cr> |

 * Use Genovation RS232 cable, part # 6RJ-Serial-Sharp.

Because the user is prompted with the screens described above, the MiniTerm must utilize **Screen Mode**.  This is done using the **Edit ROM Properties** panel.

MiniTerm Advanced ROM Properties

Mode | Keys/LEDs | LCD | Host | Beeper | Card Type | Barcode/RFID ◄ ►

Operating Mode

◌ True Terminal Mode *
   ☐ Enable host data echo

◌ Line Edit Mode *
   ☐ Mask (hide) user input *   Mask character: [*]

◉ Automated Screen Mode
   Starting Screen: [Screen 1 ▼]

Keypad Prefix character: [0] ⬍ decimal
Keypad Start character: [0] ⬍ decimal
Keypad Tail character*: [13] ⬍ decimal
Keypad Suffix character: [0] ⬍ decimal

NOTE: To disable a character, set it's value to zero.
DATA FORMAT: <prefix><start><keypad_data><tail><suffix>

* Indicates a value that the user can modify in USER Properties panel.
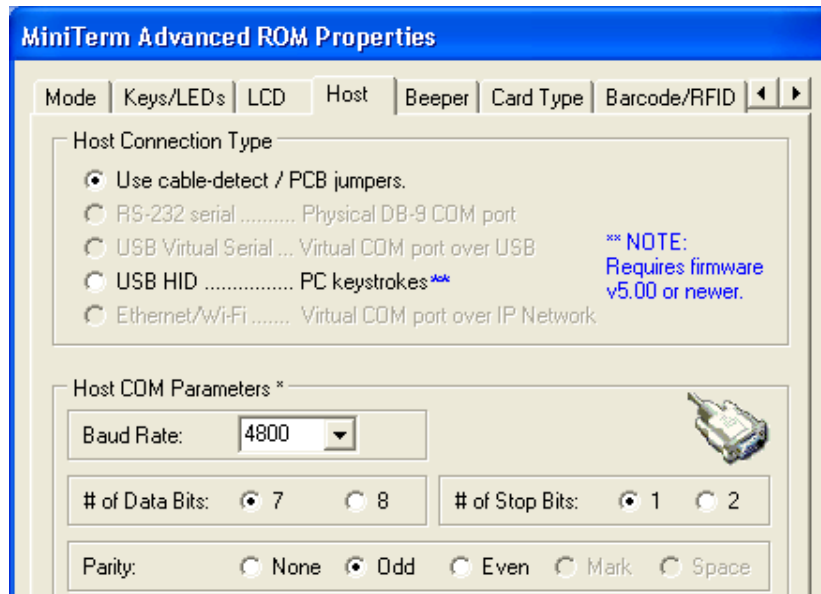
[Apply]   [OK]   [Cancel]

This **Mode tab** also sets the terminator character, which is CR (carriage return). Note that the pin-masking star character will be used (and can be changed), but enabling it is done on another screen to be described later.

The **LCD tab** sets the power-up screen that contains a reminder of the settings:

MiniTerm Advanced ROM Properties

Mode | Keys/LEDs | LCD | Host | Beeper | Card Type | Barcode/RFID ◄ ►

Size
☐ 1 line x 16 characters        ◉ 2 lines x 16 characters

Sign-On Message

ECR:Sharp UP3500
4800 701

Select a portion of the LCD text to change it.

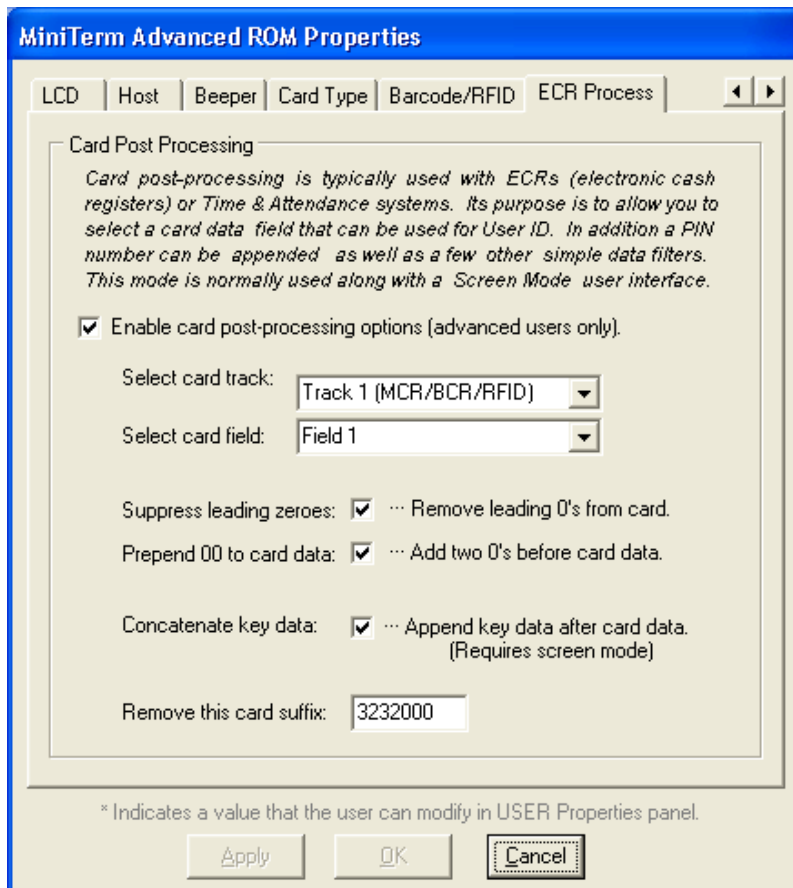The **Host tab** sets the baud rate and word format.

The **Card Type tab** sets the card as barcode, but leave everything else as-is.
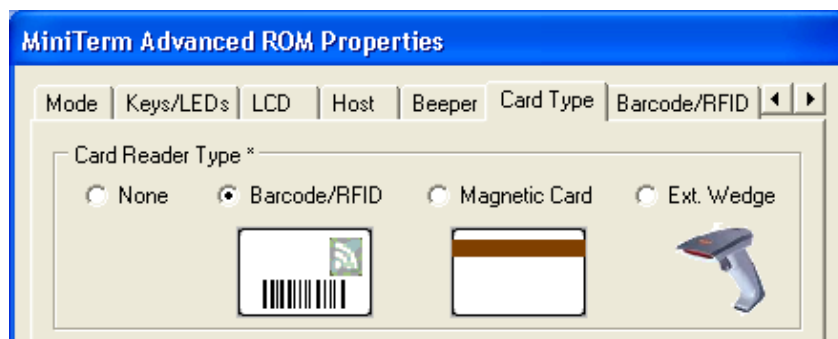


The **Barcode/RFID tab** sets the first two characters of the data packet
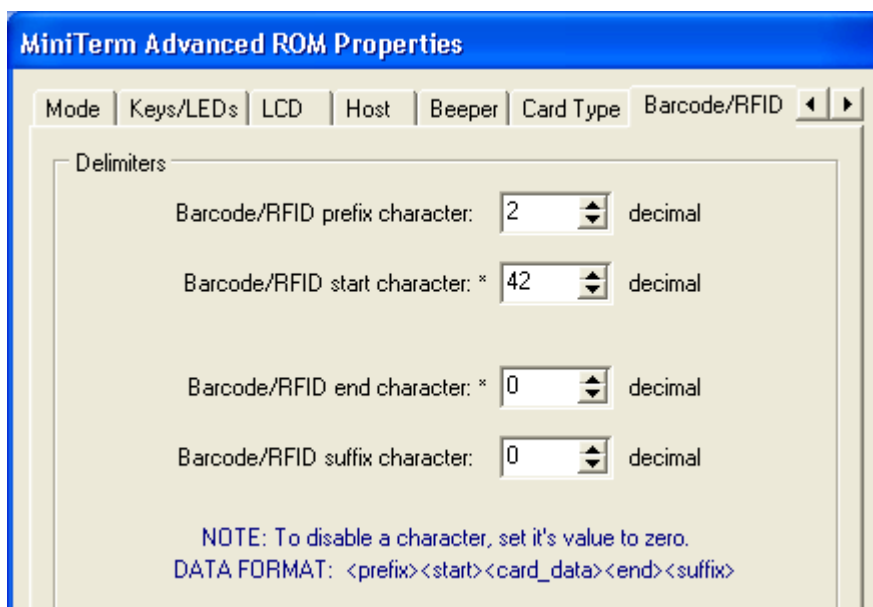
Tabbing one more over to the right reveals the **ECR tab**. This establishes the post-processing used to concatenate the card data to the PIN number.



The barcode card only has one data field, so the track # and field # should both be 1. The ECRs have a limited input field so leading zeroes are stripped, then two are added back in. This gives us a workable data size for the ECR. If the card contains the suffix 3232000, remove it. Finally, the Concatenate checkbox is checked. This causes the card data to be joined with the PIN data. To collect these two pieces of information for the user, we need to employ **Screen Mode**.
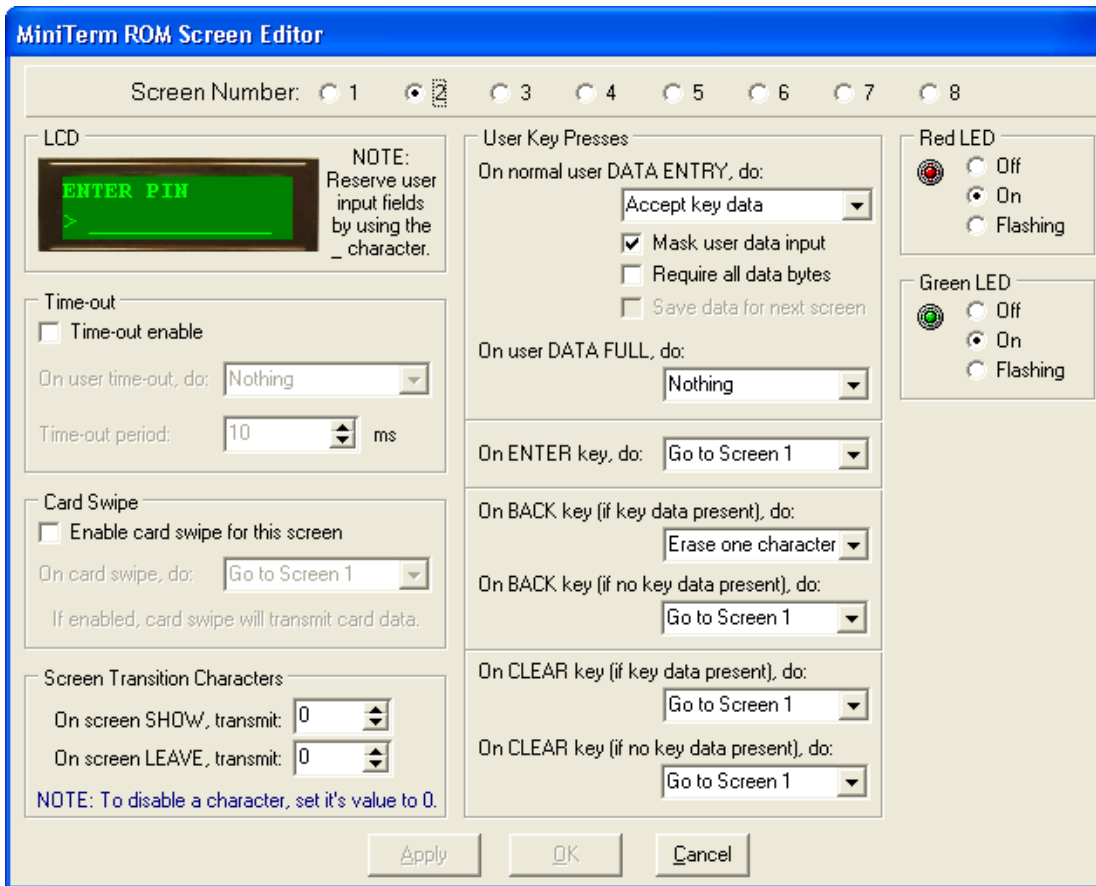
In order to edit the Screen Mode settings, close the Properties panel and return to the main form. Click on ROM Properties again, this time selecting **Edit Screen Data**.
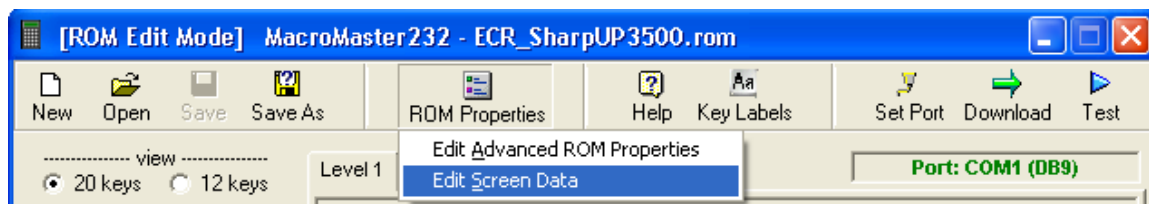
There are two screens used as shown earlier. The first screen is used to prompt the user for the card data. Everything else is ignored. Once the card is swiped, the MiniTerm goes to screen #2.
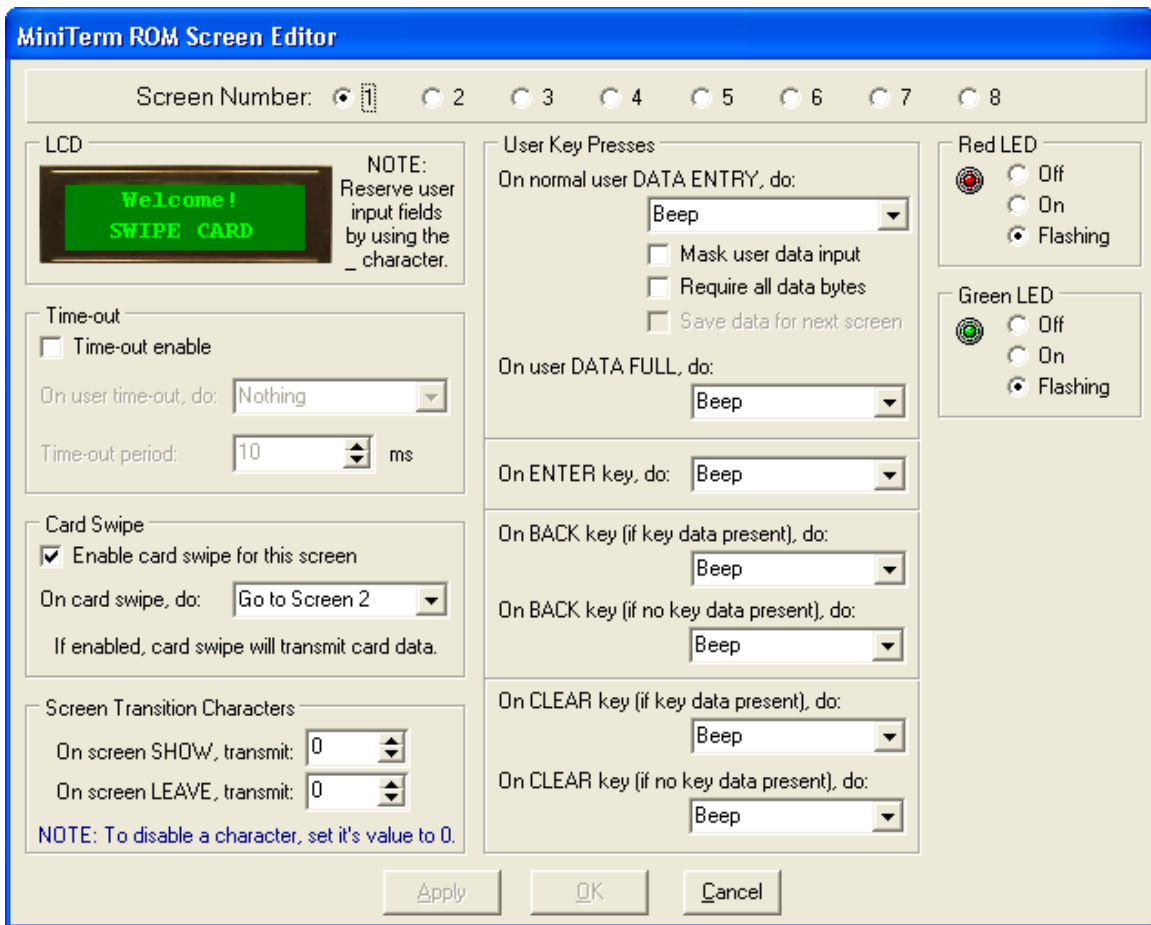


Screen Two accepts the PIN data. When the user presses the ENTER key, the MiniTerm starts the data transmission phase and then goes back to screen 1.

**MiniTerm ROM Screen Editor**

Screen Number: ○ 1  ● 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7  ○ 8

**LCD**

ENTER PIN
> _____

NOTE: Reserve user input fields by using the _ character.

**Time-out**
☐ Time-out enable
On user time-out, do: Nothing
Time-out period: 10 ms

**Card Swipe**
☐ Enable card swipe for this screen
On card swipe, do: Go to Screen 1
If enabled, card swipe will transmit card data.

**Screen Transition Characters**
On screen SHOW, transmit: 0
On screen LEAVE, transmit: 0
NOTE: To disable a character, set it's value to 0.

**User Key Presses**
On normal user DATA ENTRY, do: Accept key data
☑ Mask user data input
☐ Require all data bytes
☐ Save data for next screen
On user DATA FULL, do: Nothing
On ENTER key, do: Go to Screen 1
On BACK key (if key data present), do: Erase one character
On BACK key (if no key data present), do: Go to Screen 1
On CLEAR key (if key data present), do: Go to Screen 1
On CLEAR key (if no key data present), do: Go to Screen 1

**Red LED**
○ Off
● On
○ Flashing

**Green LED**
○ Off
● On
○ Flashing

[ Apply ]  [ OK ]  [ Cancel ]

The underscores on the LCD set the PIN field width, and should probably be shortened.  PIN-masking is turned on here.

**GENOVATION**

**MacroMaster232
Advanced Mode User Guide**

Revision 5.10
Mar 2009
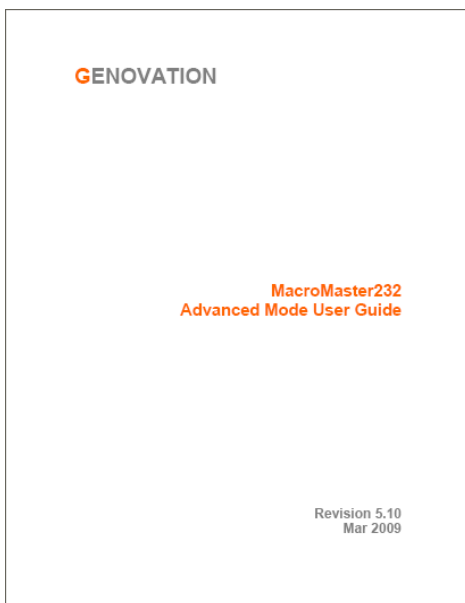
For more information, consult the Advanced user manual section on ECR programming: **"The ECR Post-Processing Page"**

 If you have any questions please contact our engineering or technical support staff.

## Erasing The MiniTerm Back To Factory Defaults

The Sharp settings require that the MiniTerm be configured for something other than the default baud rate and word format of 9600, 8N1. So in order for RSLoad to erase the MiniTerm back to factory, RSLoad must be set to the current MiniTerm format.
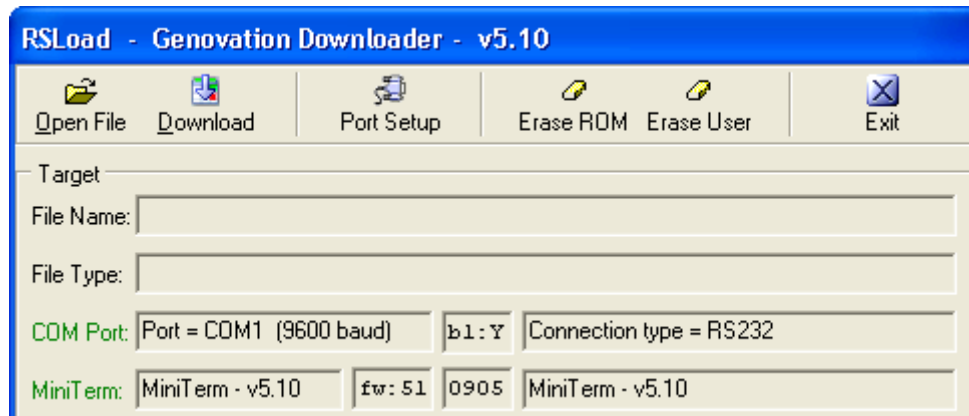
1. Hook the MiniTerm up to the PC again. Using the system tray icon, **click on RSLoad**. You will notice that the MiniTerm port settings com up in red. RSLoad cannot talk to the MiniTerm. That's because RSLoad expects 9600 8N1 and the MiniTerm is probably set for 4800 7O1. Click on Port Setup > Port Settings. Change the settings to match the MiniTerm.
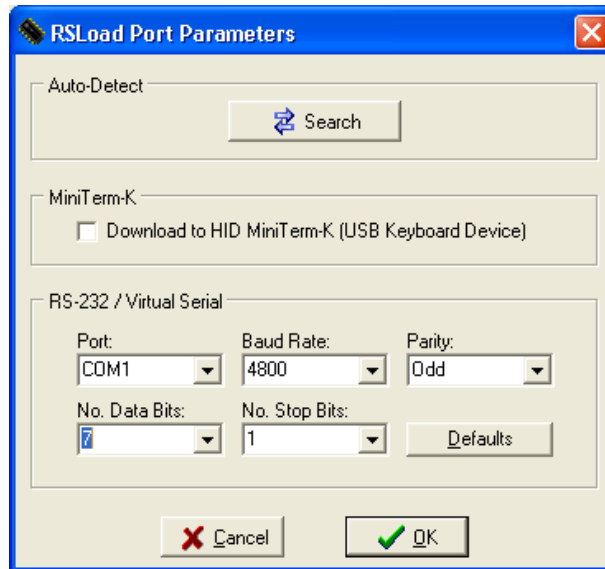


If they are correct, then you should see the following after you click OK.
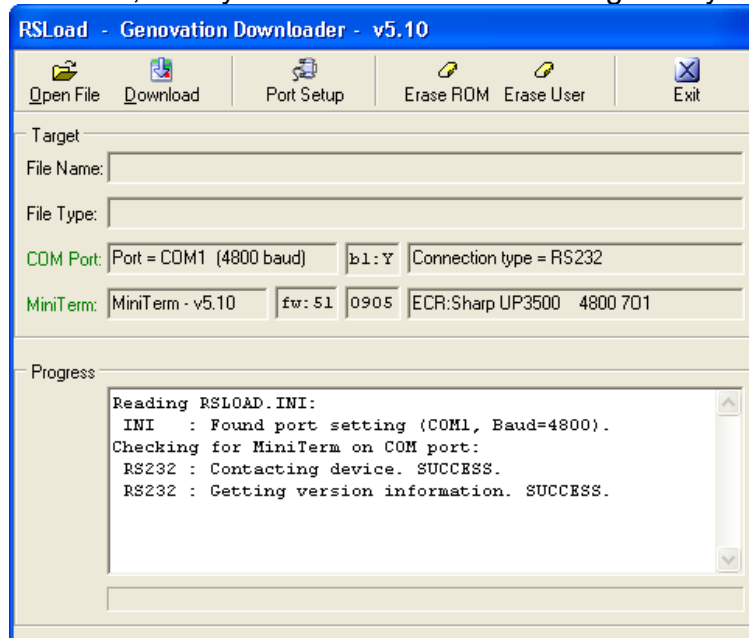
2. Click on **Erase ROM** and choose **Yes** when prompted.  This will clear out the .ROM file in the MiniTerm. The MiniTerm is back to 9600 8N1 but RSLoad is still at 4800 7O1.

3. Finally, set RSLoad back to 9600 8N1 using the port settings panel.  When finished you should see this:



You can close RSLoad.exe.