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Pinnacle Application Note

32-Bit Controller Firmware Upgrading Using HyperTerminal (AC-1200, AC-1208, LANLink M1200, and LANLink M2108)

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Pre-Site HEX File Transfer Speed Test

One of the issues that business partners will have with field upgrades of 32-Bit Controller firmware is the determination of their computer/COM port/HyperTerminal setup and whether HyperTerminal text file transfers are normal or slow. One can run a loopback firmware HEX file transfer test on a computer at the office before going on site.

This can be accomplished with a loopback connector plugged into the serial port. You can buy serial DB9 and DB25 loopback connectors. L-Com (www.l-com.com), part #MA259-IBM has a single part with both DB9 and DB25 serial loopbacks. Alternatively, one can make your own by wiring pins 2 and 3 together on either a DB9 or DB25 connector. From the HyperTerminal configuration, change the HyperTerminal Properties Settings/ASCII Setup/ASCII Receiving/ setting by checking the property box "Append line feeds to incoming line ends". Next do a text file transfer of the 32-Bit Controller firmware file. As HyperTerminal sends the .HEX file, the loopback connector feeds the data right back to the HyperTerminal screen and you see the .HEX file data scroll by. The last two lines of the firmware .HEX file are

:00000003FD
:00000001FF

When the loopback display stops scrolling by the screen and you see these two lines, you know that the text file transfer has been completed. With normal performance on a standard COM port, the HyperTerminal firmware HEX file transfer with loopback takes about 2.25 minutes to complete. With different USB-Serial interface COM ports, HEX file transfer times vary from about 12 minutes to over one hour. One can expect about the same amount of time per 32-Bit Controller firmware upgrade on site.

If the loopback file transfer test takes longer than 2.5 minutes verify you have latest version of HyperTerminal. If you were using an external USB-Serial adapter for his COM port, consider using a different computer with a built-in COM port and standard Windows COM port driver.

On-Site Firmware Upgrading - Overview

Firmware upgrades to existing inventory of 32-Bit Controller CPU modules requires a technical resource. Required is the following:

- A mobile computer with a COM port that woks with HyperTerminal verses use of the slower USB port (see above)
- A maintenance port cable
- The latest firmware version 14.72 hex file

Alternatively, instead of HyperTerminal, one can use new program Sielox developed called the 32-Bit CPU Interface Port Utility. This utility works much better than HyperTerminal with some COM ports, but especially with USB-Serial adapters. This utility also always displays the status indicator dots sent by the CPU module during a download. Some versions of HyperTerminal will not display data received (the progress dots) during a text file transfer. Contact Technical Support for more information.

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Status dots during a firmware download should be displayed at a rate of about one dot per second. Each status dot represents 100 lines of the hex file. Essentially, one will know if HyperTerminal is performing normally if a text file transfer has been initiated and the progress dots are displayed on the screen at a rate of about one per second. If the progress dots are displayed at a rate of about one per minute or slower, it means that the HyperTerminal file transfer is not performing at the normal rate. Sielox suggests if the transfer rate appears slow, close HyperTerminal and reset the CPU module. Once a CPU module is installed on a backplane and powered up, a firmware upgrade should take about 2 minutes with the use of a COM port. Again, see above for pre-site testing suggestions. With a less than ideal set-up, a firmware upgrade can take hours to complete instead of 2 minutes.

On-Site Firmware Upgrading - Steps

I. The following properties configuration of HyperTerminal Private Edition version 6.3 are recommended:
   a. On the Settings tab:
      i. Function/Arrow/Ctrl keys selection should be: Terminal Keys
      ii. Backspace keys sends selection should be: Ctrl+H
      iii. Emulation should be selected as ANSI
      iv. Other settings can be selected by personal preference
      v. ASCII Setup button should be clicked and ASCII Setup configured as:
         - Send line ends with line feeds box NOT checked
         - Echo typed characters locally box NOT checked
         - Line delay of 0 (zero)
         - Character delay of 0 (zero)
         - Append line feeds to incoming line ends box NOT checked
         - Force incoming data to 7-bit ASCII box NOT checked
         - Wrap lines that exceed terminal width box IS checked

II. On the Connect To properties tab, the "Connect Using:" selection should be for a true available COM port. Below the COM port selection is a Configure... button. This button should be clicked and the following Port Settings should be selected:
   i. Bits per second: 57600
   ii. Data bits: 8
   iii. Parity: None
   iv. Stop bits: 1
   v. Flow control: None

III. With HyperTerminal properly configured and running, the following process is used to upgrade 32-Bit Controller Firmware:
   a. A maintenance port adapter cable must be installed on the CPU module with an RS-232 cable connected between the appropriate computer COM port and the maintenance port adapter cable.
   b. The 32-Bit Controller must be powered up. If the controller is already powered, the reset button on the CPU module must be pressed. The following information should then be displayed on the HyperTerminal screen:

```
INITIALIZING . . .  . . .
```

```
INSTALLED RAM MODULES:
<INSTALLED MODULES LISTED HERE>

***** PRESS ENTER FOR FIRMWARE MAINTENANCE *****
```

c. D. At this point, one has about one second to press the Enter key on the computer keyboard. If the Enter is pressed at this time the controller firmware will display controller module version numbers and the following menu:

```
SUPERVISORY PROGRAM MENU:
  1 - START FLASH ROM DOWNLOAD
  2 - START MAIN TERMINAL CONTROLLER PROGRAM
  3 - START MANUFACTURING TEST PROGRAM
  4 - GO TO
  5 - RESTART CONTROLLER

  MAKE SELECTION

INSTALLED RAM MODULES:
<INSTALLED MODULES LISTED HERE>

***** PRESS ENTER FOR FIRMWARE MAINTENANCE *****
```

d. E. At this point, one should press the '1' key on the keyboard to download firmware. The controller will then display:

```
PREPARING FOR FILE DOWNLOAD, PLEASE WAIT . . .
READY FOR FILE DOWNLOAD
```

e. The time between the "PLEASE WAIT . . ." prompt and the "READY FOR FILE DOWNLOAD" prompt is about one second.

f. Once the "READY FOR FILE DOWNLOAD" prompt is displayed, click the "Transfer" menu on HyperTerminal and then select "Send Text File...".

g. HyperTerminal then provides a Windows file open dialog screen. The "Files of type:" selection at the bottom of this screen should be changes from "Text file (*.TXT)" to "All files (*.*)" One can then browse or search the computer's file system for the appropriate firmware hex file that we have provided. This file will have the .HEX suffix. When the correct file is found, select by single clicking and then press the "Open" button on the window or double click on the file to open it. Once the correct .HEX file is selected and opened from this window, HyperTerminal will start transmitting it to the CPU module.

h. The firmware download progress dots should then appear on HyperTerminal screen at a rate of about one per second until the entire file has been transferred.

i. Following the download, there a few messages from the CPU module as it re-programs the Flash ROM and restarts the controller:

```
PREPARING FOR FILE DOWNLOAD, PLEASE WAIT . . .
READY FOR FILE DOWNLOAD
.....................................................................
.....................
.........................
DOWNLOAD SUCCESSFUL

REPROGRAMMING -- DO NOT RESET OR REMOVE POWER!

REPROGRAM COMPLETE, RESTARTING
```

j. Once the download had been completed, reprogramming and restarting only takes a few seconds. The controller will then display the same startup messages as before. Instead of pressing the Enter key in response to the "PRESS ENTER FOR FIRMWARE MAINTENANCE" prompt, wait for the following Terminal Controller firmware start-up message:

```
AC-1200 TERMINAL CONTROLLER
COPYRIGHT (C) 2002-2004 CHECKPOINT SYSTEMS, INC.
FIRMWARE VERSION: 14.72
<OTHER STARTUP MESSAGES HERE>
```

k. As a final check, make sure that the firmware version number displayed by the 32-Bit Controller is the version that he expected to install. The firmware upgrade is complete at this point.

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