How to program Adapt812DX with HyperTerm

To program External memory the internal EEPROM of MCU are program with Flash Loader utility called MXFlash.

http://www.interlog.com/~techart/myfiles/files/mxflash.zip
http://www.technologicalarts.com/myfiles/812expanded.html

The MCU must boot up in single chip mode in order for the Loader to work. Set the various jumpers as indicated below.

Jumper settings for MODA and MODB for single chip mode.

JB1 – pin 2 and 3 shunted – MODB
JB5 – shunted – MODA
SW3 to SGL (single chip) position.

Jumper settings for FLASH and RAM with REV0 to REV2A

JB3 – pin 1 and 2 shunted
JB4 – CSP0 and F shunted
JB6 – CSD and R shunted

Jumper settings for FLASH and RAM with REV3

JB3 – pin 1 and 2 shunted (CSD* RAM enable)
JB6 – pin 1 and 2 shunted (CSP0* FLASH select)
JB7 – pin 1 and 2 shunted (RAM write enable)

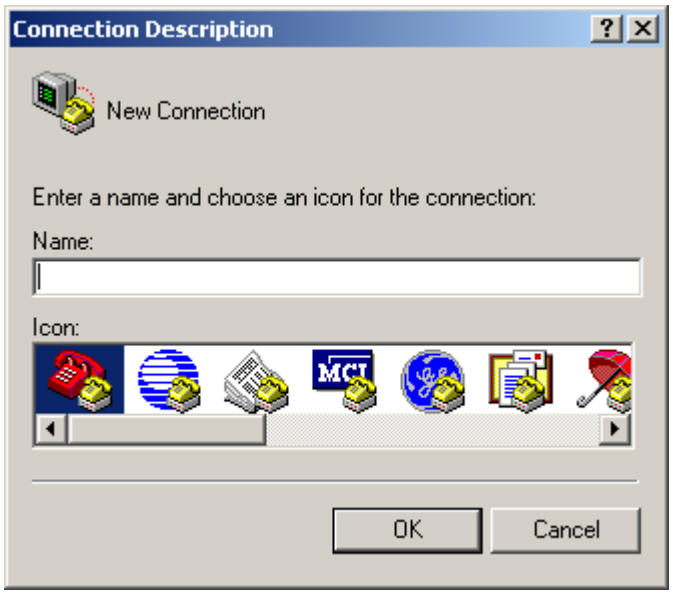
Once the jumpers are set one can proceed to programming the external FLASH. Other terminal program can be used just as long as one is familiar with how to use that program.

In this example the HyperTerm Terminal program will be use because it is already (usually) as part of Windows OS installation.

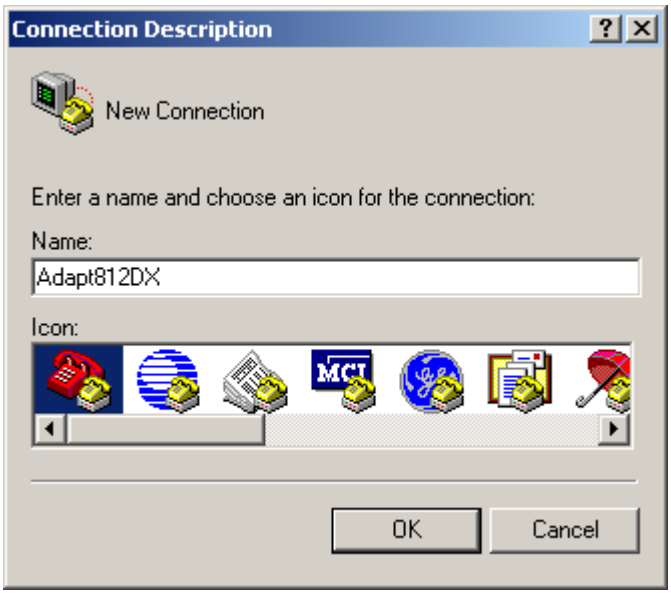
Setting HyperTerm:

The procedures are for WinXP, it may differ with different OS.

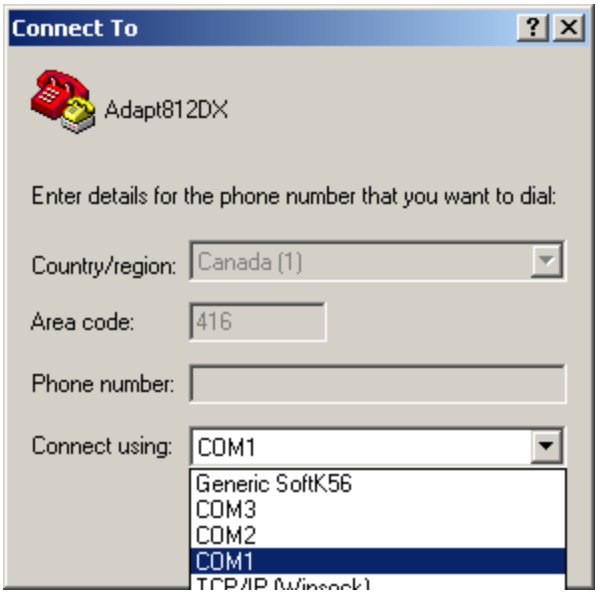
Start – Programs – Accessories – Communications – HyperTerminal



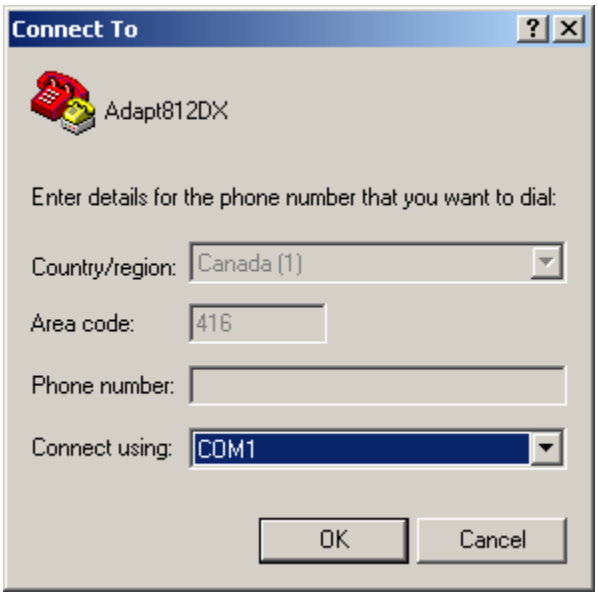
Give it a name.



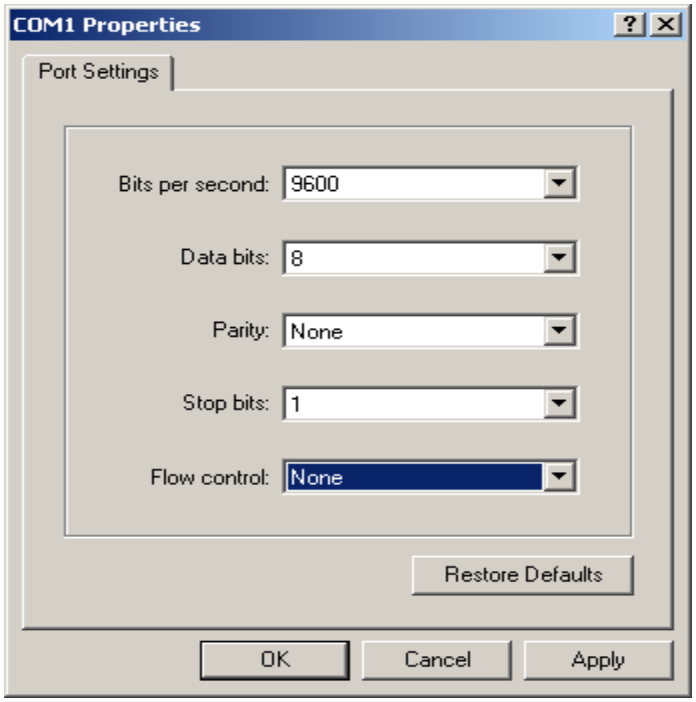
Choose a COM port to use.



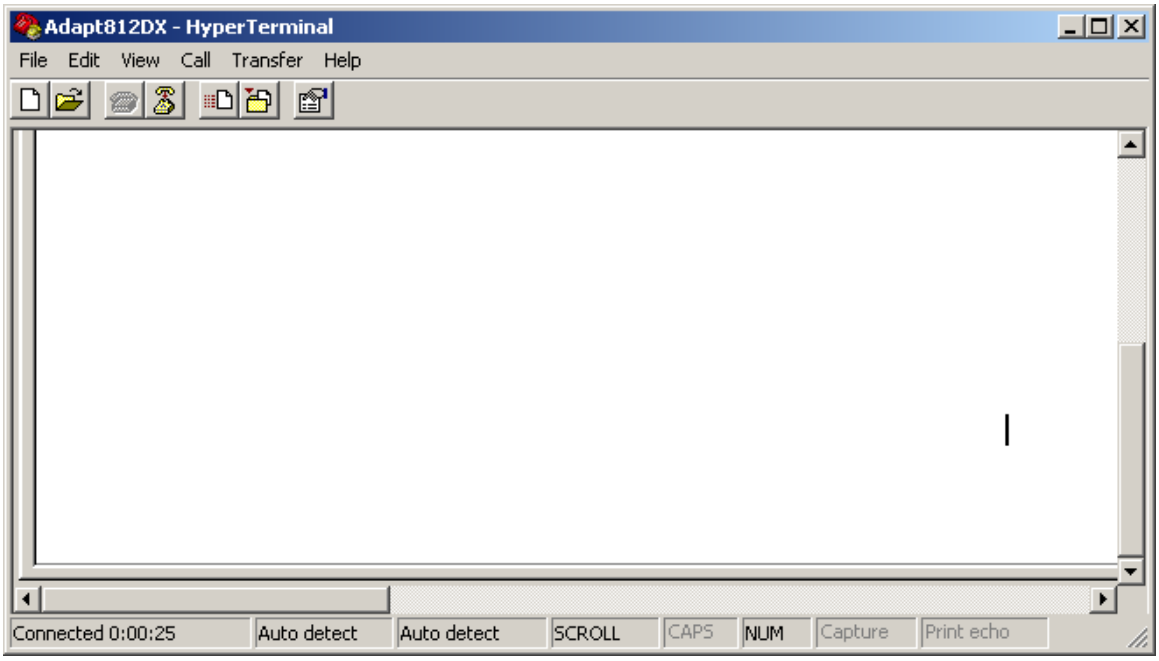
In this example, COM 1 is selected.



Set the BAUD parameters as shown to ***9600, 8, N, 1*** and set Flow control to ***None***.



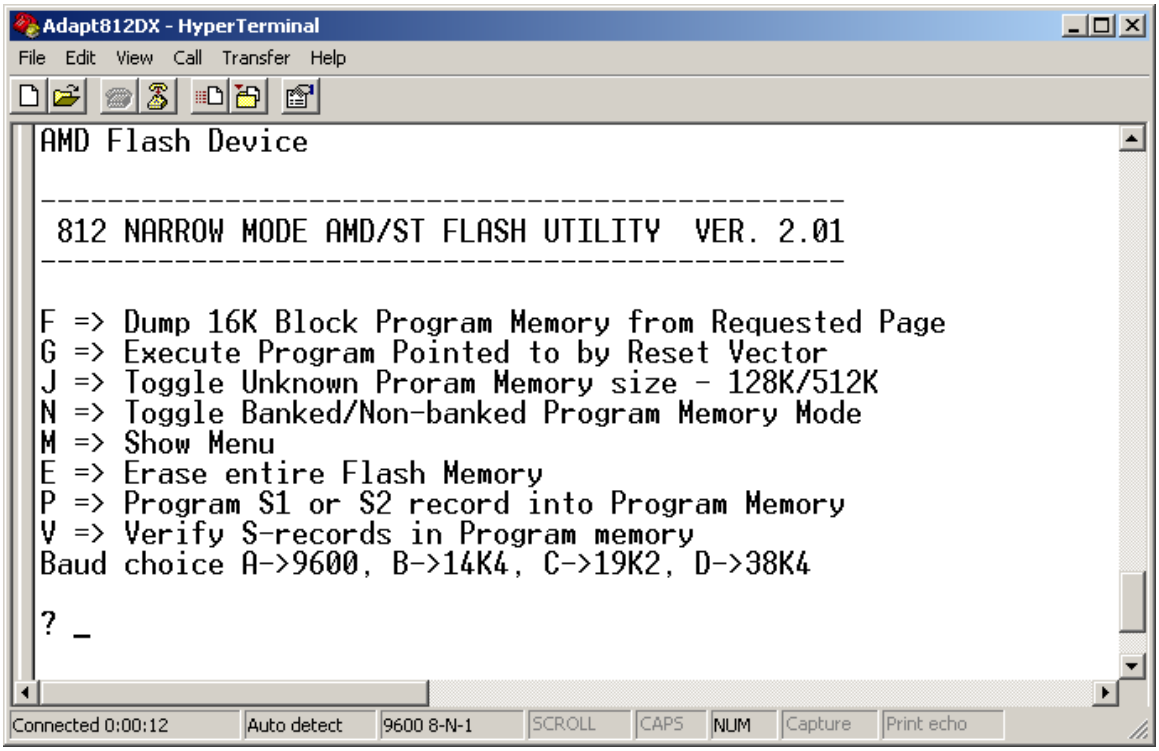
Once the above are set we can proceed to connect the Adapt812DX to COM 1. Below, HyperTerm is ready to connect to COM 1.



Connect Serial Cable to COM 1 at the back of PC and to the Adapt812DX. Slide SW2 Run/Boot switch to Run position. Make sure SW3 is in SGL position.

Power up the Adapt812DX board with a known good power supply, making sure the PWR LED is on. Once the board is powered, HypeTerm should display the MXFlash Loader menu as shown.

Notice that it detected the FLASH to be ***AMD Flash Device***. If the Loader cannot detect a FLASH memory it will display unknown Memory and will assume that the memory is RAM.

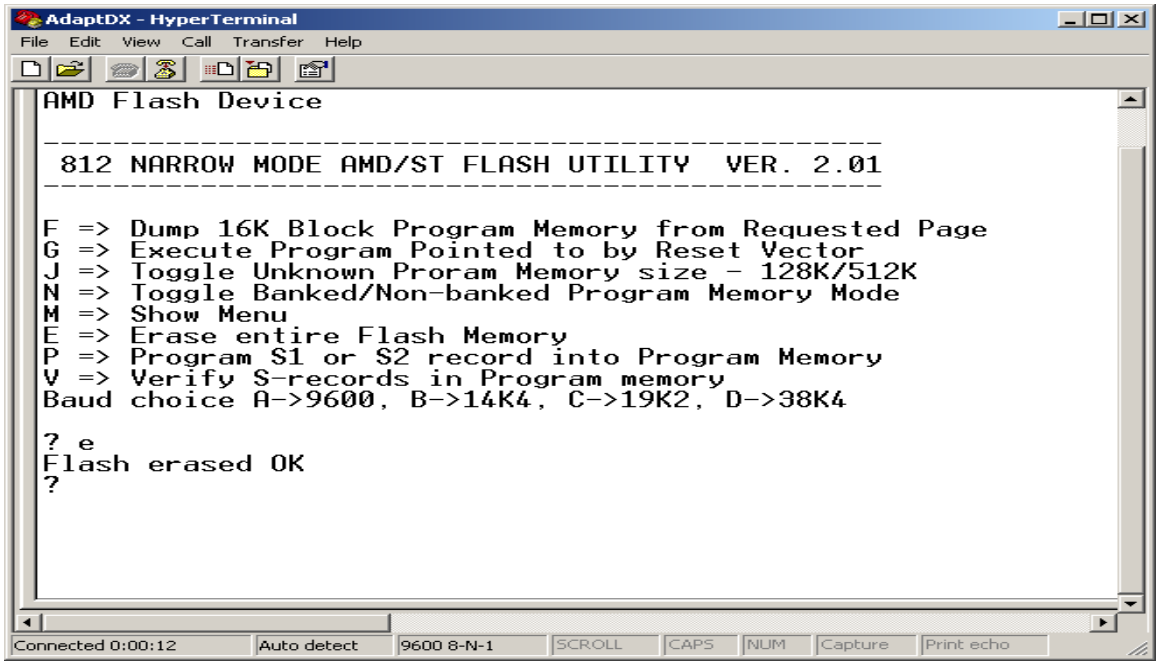


There are several things to check if the Menu will not show up as shown above.

- Do not use NULL cable. Use a straight thru cable.
- Check and verify the cable is connected to the correct COM port.
- Re-boot the PC if necessary as other application may have corrupted the OS.
- Use known good serial cable.
- If there are other problems, test the COM port with another device that is known to work.
- If the FLASH type is not recognized re-check jumper settings. If still unrecognized then the board has a problem.

Erasing:

To erase the FLASH the command is ***E***.

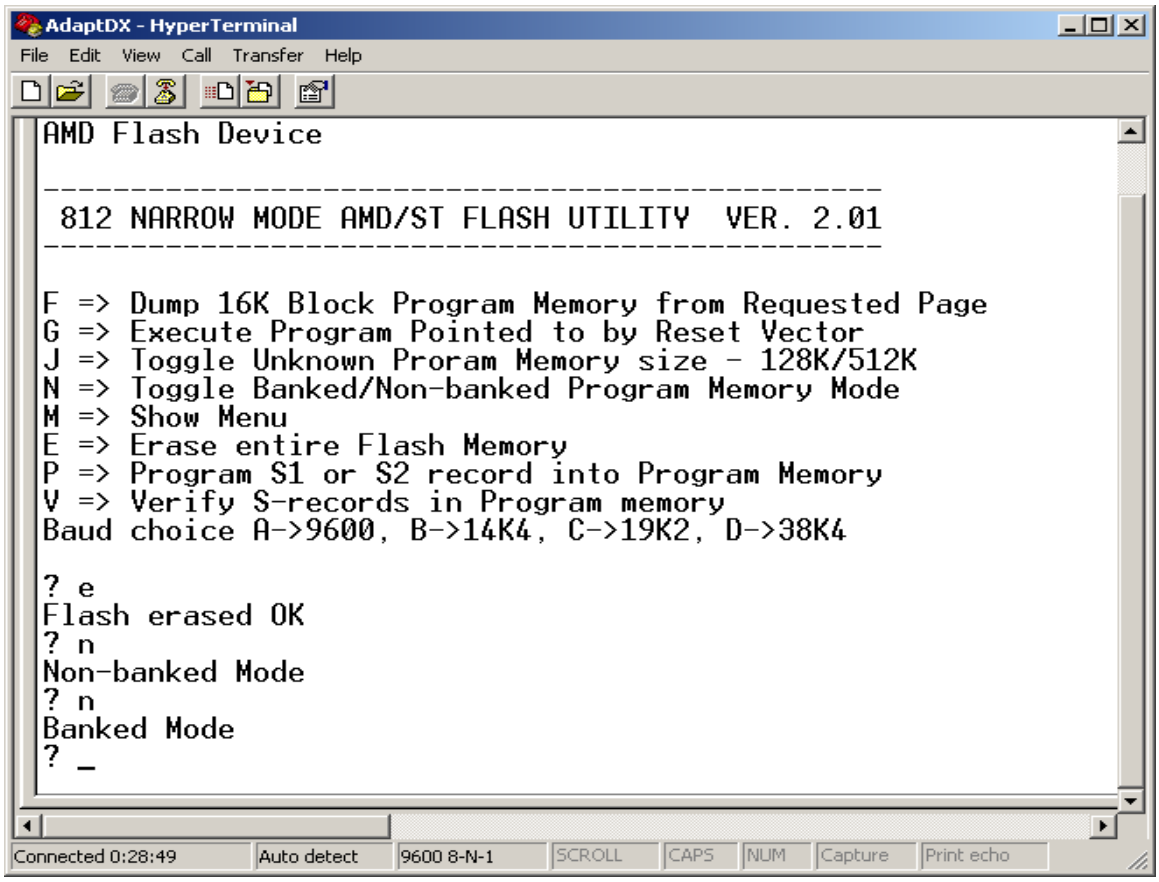


Programming:

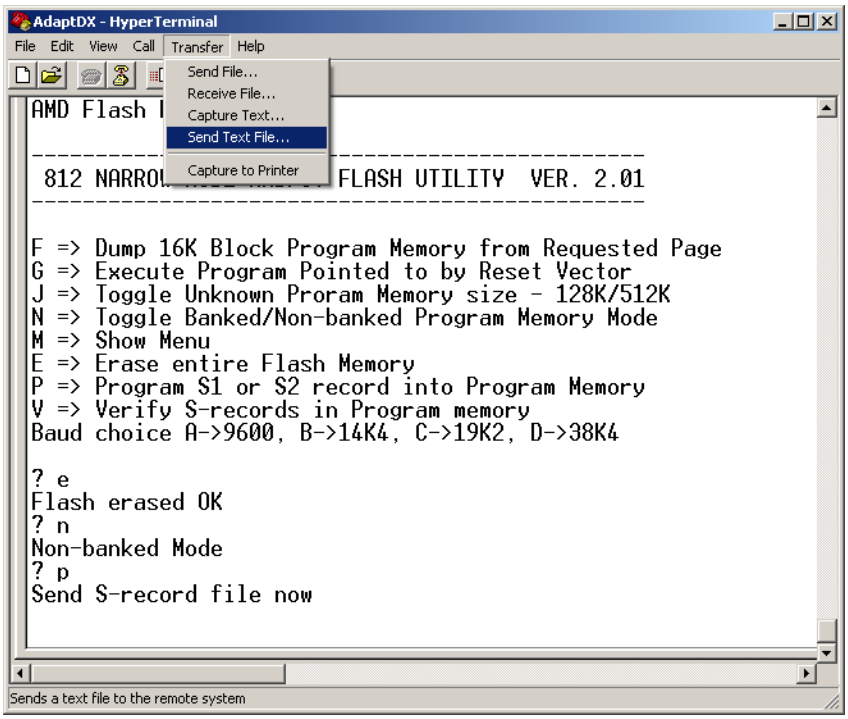
There are 2 options for programming the FLASH. The 1st is whether the S-record is BANKED. The command is ***N*** to toggle from BANKED to NON-BANKED. ICC12 creates mixed S1 and S2 record. This is generally called BANKED mode. One should always check the S19 record to see if there are S1 and S2 mixture. Other compiler creates BANKED S2 too. One should experiment whether to program the S-record as BANKED or NON-BANKED.

By choosing the ***N*** command the loader will always toggle from previous state to the next. By default it is set for BANKED mode.

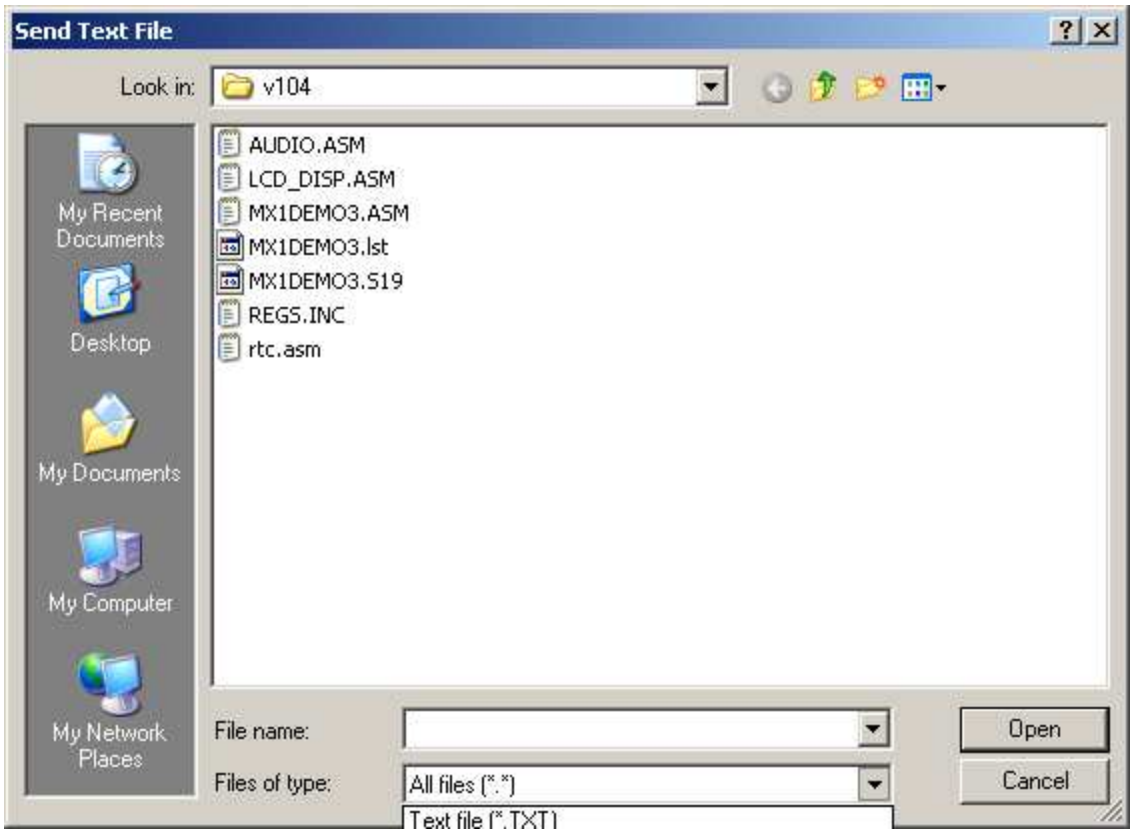
If the S-record contain only addresses from $C000 to $FFFF then it should always be programmed as NON-BANKED. Linear S2 record must always be programmed as NON-BANKED.



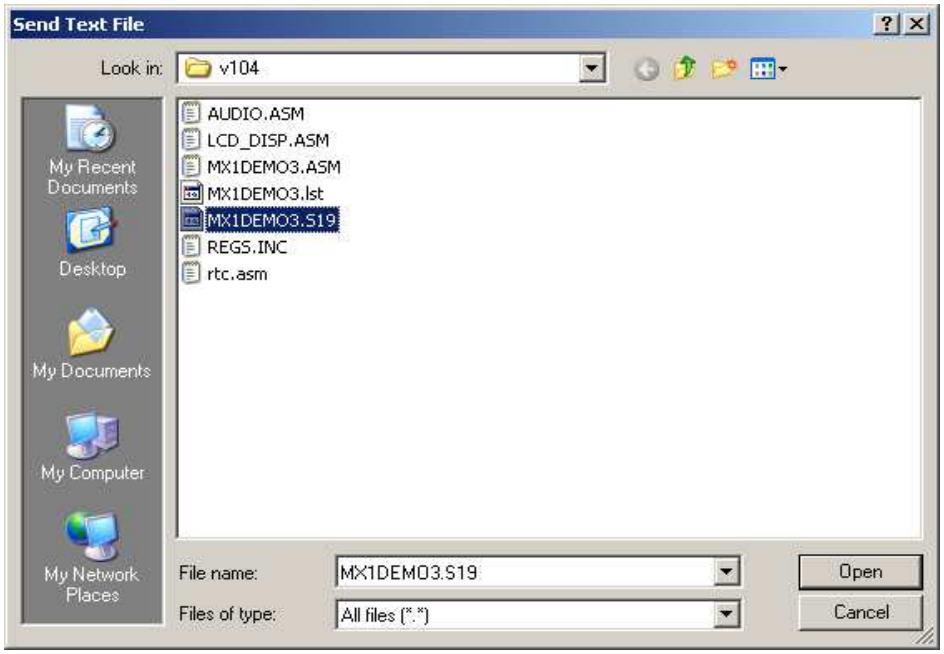
To program press ***P*** once press click Transfer menu – Send Text File



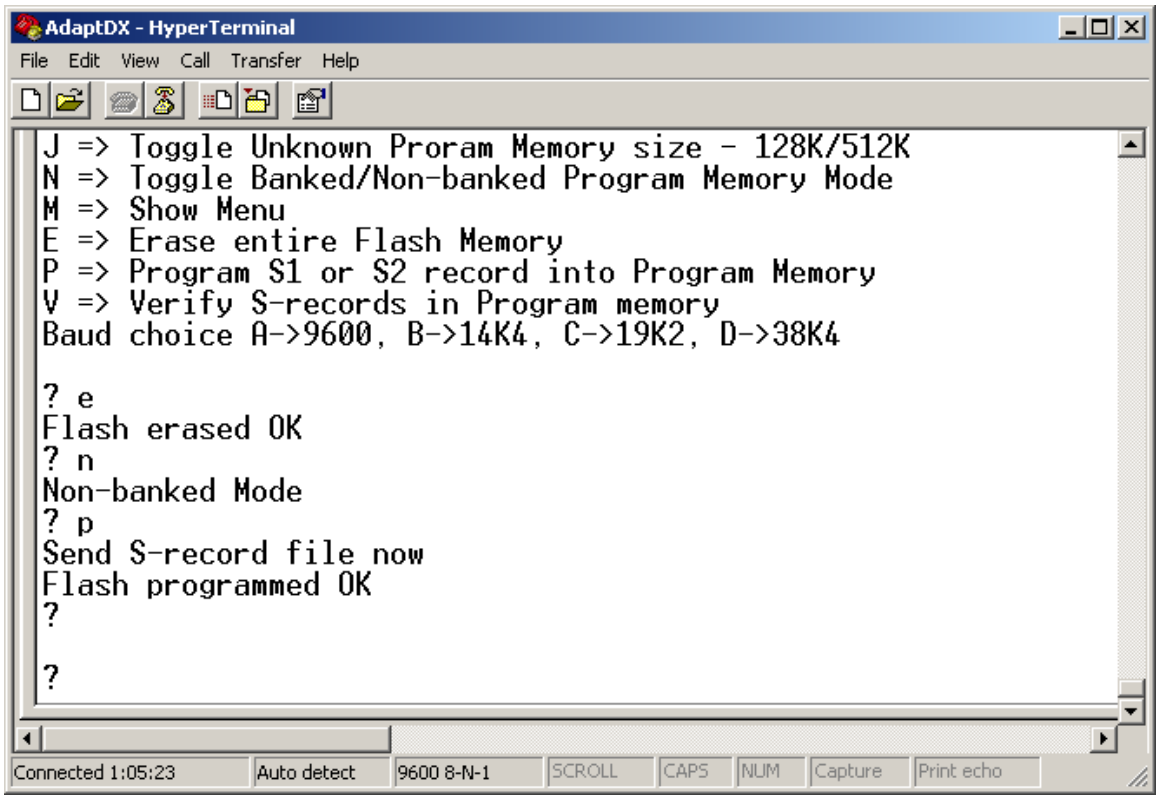
HyperTerm will open an explorer window to help locate the file to be uploaded. Change file type to All files.



Click on the S19 record to be uploaded and press the ***Open*** button.



After uploading the message ***Flash programmed OK*** will appear to show the programming is finished.



After programming, slide SW3 to EXP (MODA = 1) then press the RESET button. The programmed application in now running in expanded NARROW mode.

Checking DATA in Load mode:

The command is ***F*** for memory dumping DATA from FLASH. This is used to check certain parts of the memory.

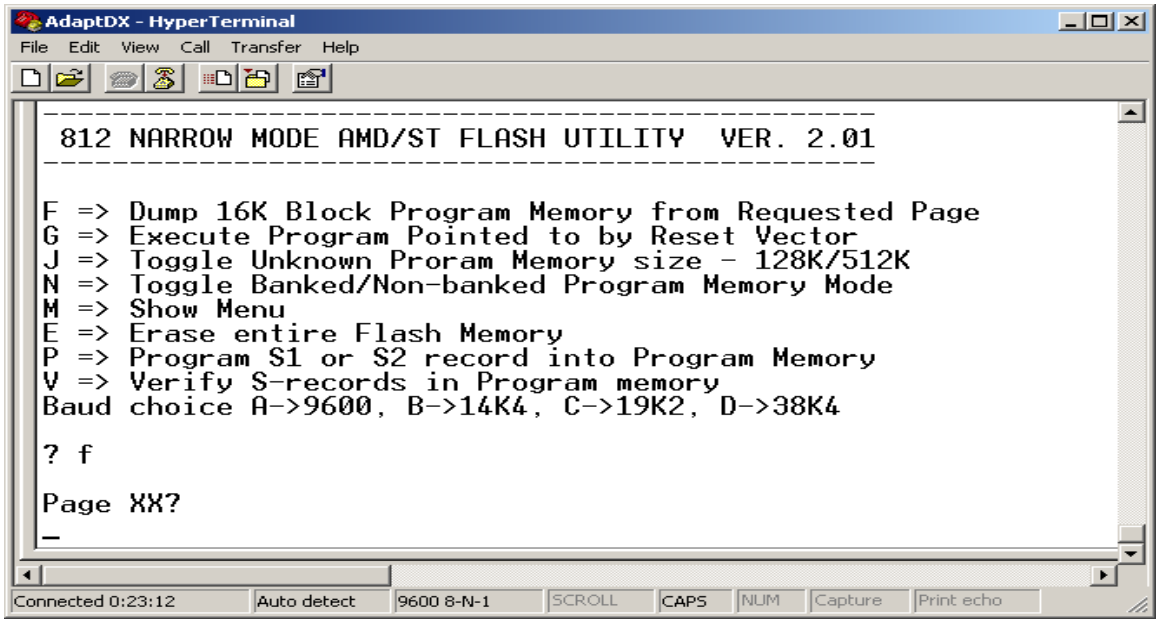
For example, one may want to check the address from $C000 to $FFFF. How is this possible? There are few things that needs to be understood. The memory block $C000 to $FFFF is always present in the memory map. This is where the ISR and start of code resides. When servicing an ISR it is possible to access a different PPAGE. With 128Kbyte Flash, the $C000 to $FFFF can be access at PPAGE = $07 in the page window $8000 to $BFFF.

Calculating PPAGEs:

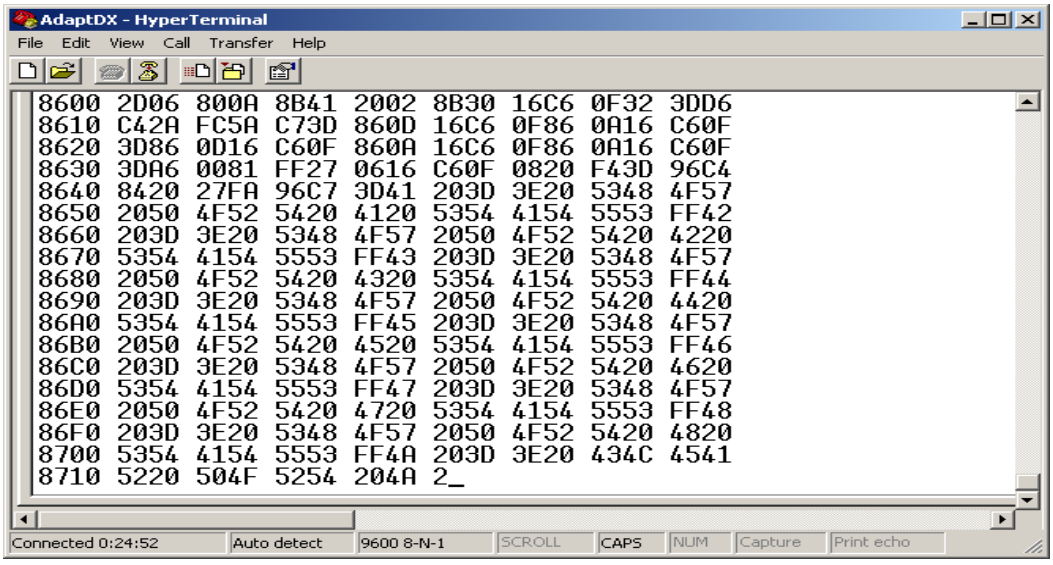
To calculate how many PPAGE in 128Kbyte (AM29F010) is to have 128K/16K = 8. Therefore there are 8 PPAGEs beginning from $00 to $07. A page is always = 16K.

For 512K FLASH (AM29F040) there would be 512K/16K = 32. Therefore there are 32 PPAGEs beginning from $00 to $1F. Address $C000 to $FFFF is PPAGE = $1F

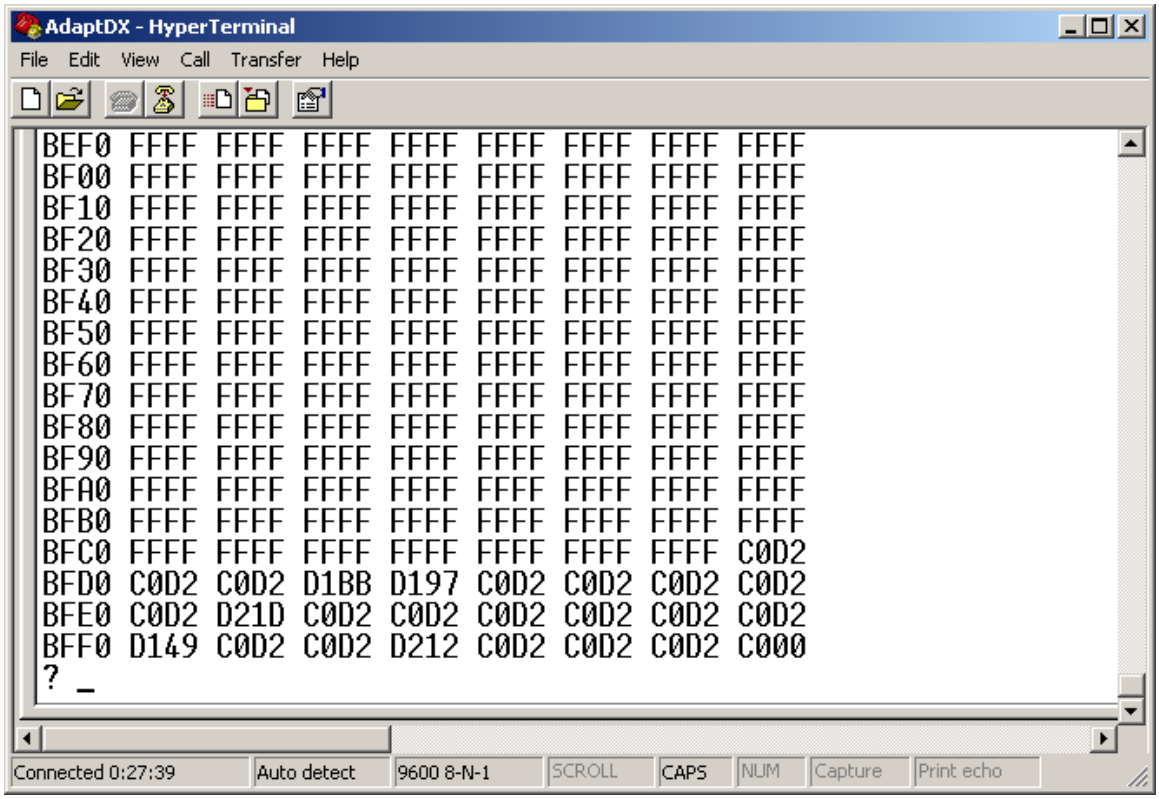
Here is an example to dump $C000 to $FFFF with a 128Kbyte Flash. Select ***F*** command then type the value ***07***



Immediately after it would begin to dump the DATA beginning at $8000 to $BFFF. Please note that PPAGE = $07 at $8000 to $BFFF is the same as $C000 to $FFFF



Below is at the end of DATA dump.



Note that at address $BFFE:BFFF is equal to $FFFE:$FFFF. The value is seen to be $C000 the start of code.

This tool is implemented to help diagnose where are the DATA being programmed too from an S-record file.

Executing Program in Load Mode:

The command is ***G*** to execute the already program code. The Loader will fetch the address at $BFFE:$BFFF (PPAGE set at the Last page) then start executing the code at that address. For example, if the value was $C000, the loader removes the EEPROM out of the memory map, read the vector address and make Register X equal $C000 and jump to $C000 with Register X.

Note:

In load mode certain registers are initialized. The stack is set to $0C00, MODA:MODB in expanded narrow mode including the various expanded register controls. Lastly the COP control is disabled.

Problems:

Q. Programmed okay but will not appear to run.
A. Toggle from BANKED to NON-BANKED or vice-versa then erase and re-program again.

Q. Tried to program in BANKED or NON-BANKED, Flash programmed OK but will not work.
A. There are 3 things to check.
1. COP control needs to be disable if not being serviced.
2. Check if the Stack is initialized
3. Check if the Power ON reset vector is correctly pointing to start of code.

Q. Programmed OK and runs with G command but not in Expanded mode.
A. Check the stack is initialized and COP control disabled if not being serviced. In load mode the stack is initialized and COP disabled.

Q. During programming the red LED comes on
A. The Loader is unable to program into a memory location. The reasons are many.
1. The S-record may contain code that are manipulating the registers.
2. The S-record may contain addresses that are outside the bound of the FLASH chip.
3. Lastly, the FLASH memory maybe faulty.

Q. Programming Rev3 is different from Rev2A.
A. Verify the jumper settings FLASH and RAM

JB3 – pin 1 and 2 shunted (CSD* RAM enable)
JB6 – pin 1 and 2 shunted (CSP0* FLASH select)
JB7 – pin 1 and 2 shunted (RAM write enable)

Please note that this problem is recent. We are investigating why there is a difference between these Revs.