PC DOWNLOAD UTILITY
User Instructions

Date: Saturday, November 01, 2003
Version: 2.0c

# 1.0 DESCRIPTION
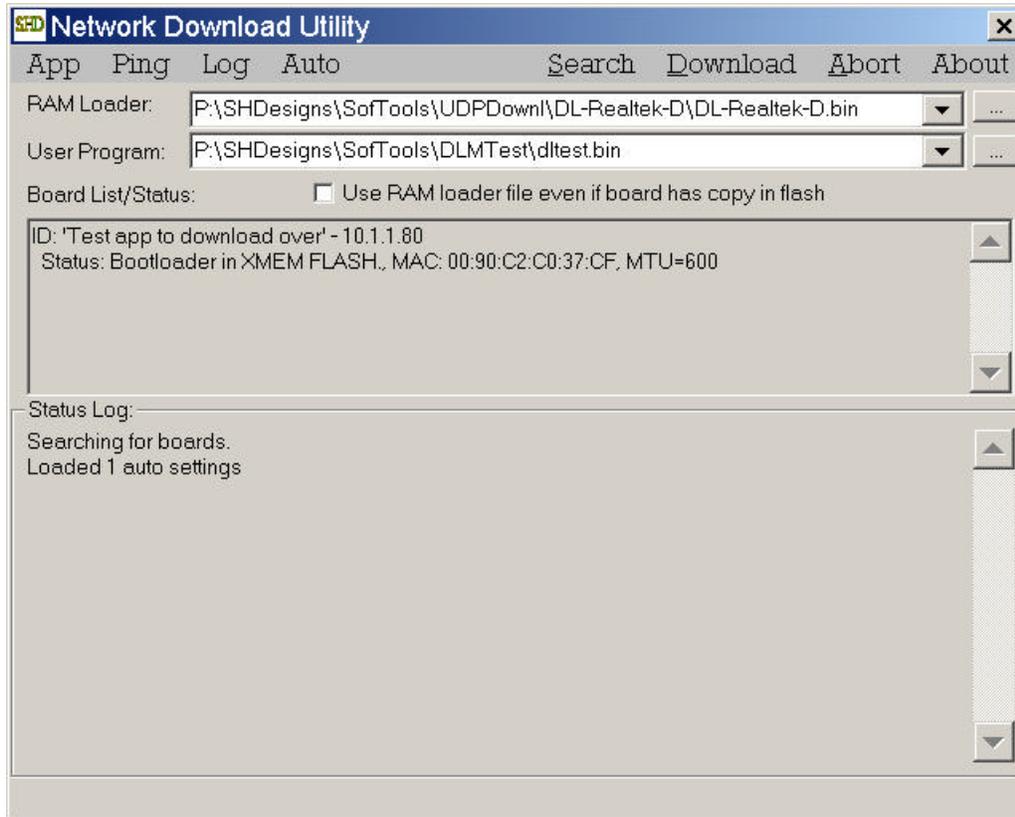


The above screen is from the 2.0 version. Earlier versions are similar except there is no menu. The menu command have equivalent buttons in the dialog.

## 1.1    Installation

The PC utility is called UDPDownload.exe. There is no installation needed. It can run from anywhere.

The program uses an .ini file, udpdownload.ini,  to store the last RAM loader file and user binary file locations. The next time the program is run, the file names will default to the last used.  Note: version 1.x used the registry for these settings.

Any PC can be used that runs windows. The program has also been run under Wine in Linux.

## 1.2 Requirements

Only boards on the local LAN segment will be accessible via the search function. For applications where the board is on a different segment, the easiest way would be to use a laptop with a crossover cable and connect directly to the box.

The downloader will work through a router if needed but the search function will not work. The "Ping Specific IP" command from the search menu can be used to query a board on another sub net. The utility will then query the board through any routers. Later in the download, the ping IP will be used. The "ping" command has been tested through firewalls. A firewall needs to have UDP port 2000 forwarded to the Rabbit board. There is also a "Ping List" command in the Ping menu. This allows a list of addresses to be searched.

One problem may be that the board is configured for an IP address that is not correct for the current LAN. This would be if a board is temporarily connected to a different LAN for programming. The board may appear in the board list, but will fail to download if the IP address is not correct for the current LAN.

The "Set board Address" command in the search menu is used for this situation. Note: This will by default, assign ALL boards that support the download on the current LAN segment with the download program to the desired IP. There is an option to specify the MAC address of the board to assign the IP address. Select an IP that is on the local LAN sub net and is not used by another PC.

The downloader requires two files. The first is the RAM loader. If the board reports "Has loader in XMEM", this file is not needed as it is included in the system. The "Use ram loader even if board has copy in flash" option will allow a different loader to be used when boards have a RAM loader in flash.

The second file is the user program. This is the .bin file generated by Dynamic C or Softools.

The file name may be entered in manually in the two edit fields. Or, the "..." buttons can be used to browse for the file.

## 1.3    Encrypted .bin files

The loader now supports encrypted RAM and user program files. The encryption may include a password. When a password-protected file is downloaded, the user will be asked for the password. If the password matches, the download will take place. If an incorrect password is entered, the download is aborted.

An encrypted file may have no password. In this case, the user is not prompted for a password. As of 3-23-2003, all of the RAM loaders are now available encrypted with no password.

## 1.4    Programming the Boards

The utility will search for board upon startup. It should find the boards. If not, either the "Set board Address" function or the "Ping Specific IP" functions from the search menu may be needed as described earlier. If no boards are in the list, the utility will search every 10 seconds or so.

The board list should show the boards found. If none are found or the list needs to be updated, use the "Search" button.

At this point, the list should show all the boards by name. They will have the "Needs Boot loader" status appended to the name. If the board includes the RAM loader in FLASH, the status will show "Has boot loader in XMEM FLASH." If possible, the MAC address is shown. The last 6 digits will match the Z-World serial number of the board or module. This will help identify multiple boards with the same ID.

To download, press the download button. If more than one board is found, a dialog will be provided to select the board or boards to download. Version 1.5 or later allows multiple boards to be downloaded. When multiple boards are downloaded, they are programmed one at a time.

The download will perform the following steps:
1. Send a request to the board for xmem to store the RAM loader (if needed).
2. Download the RAM loader (if needed.)
3. Send a "Run" command to start the RAM loader code.
4. Ping for the board to find response from RAM loader.
5. Download the user code.
6. Send a "Reboot" command to run the user code.

Each step is acknowledged by the board. A progress bar on the bottom of the window shows download completion.

Once the download is complete and the board has restarted, you should be able to perform a new search and see the board report the new status string (if new code has different ID string.)

## 1.5   Errors

The utility verifies each operation.  It will try to recover from errors.  The status log window will show these errors. The download can be retried if it fails.

Some notes:
1. Once the utility starts downloading the user FLASH code, the board is susceptible to a power loss or reset. If the board is reset in the middle of a download, it may not recover. In this case the only way to fix the problem would be to use the Rabbit RFU utility and the serial debug cable. Use of protected RAM loaders will prevent this problem from happening.

2. Using the "Set board IP" function will likely kill any existing connections to the board has to other systems.

3. If the board changes its IP after UDPDL_Init() is called, the RAM loader will use the old address. Make sure to call UDPDL_Init() again if the IP is changed.

## 1.6   Automatic Download

Version 2.0 of the PC utility supports automatic downloading. The utility maintains a list of old versions and new files to download. When a new board appears in the list that matches one of the old versions, the new one is automatically downloaded.

From the Auto menu, use the Add/Edit Auto update Entry:
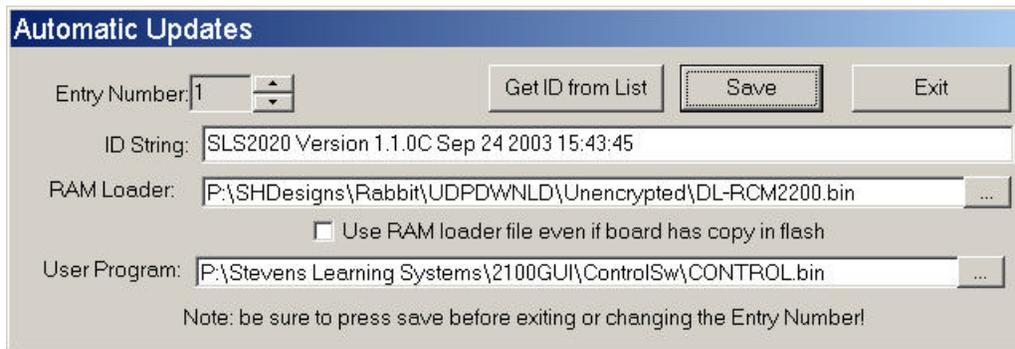


The "Get ID from list" button can be used to copy the ID string reported by an existing board. Be sure to hit save before changing the entry number or exiting the dialog.

This information is maintained in the file udpdownload.ini that is stored in the same directory as the executable. The settings shown above are as follows:

[Auto Setting-1]
Ram Loader=P:\SHDesigns\Rabbit\UDPDWNLD\Unencrypted\DL-RCM2200.bin
Rom Loader=P:\Stevens Learning Systems\2100GUI\ControlSw\CONTROL.bin
ID String=SLS2020 Version 1.1.0C Sep 24 2003 15:43:45
Force Ram Loader=0

Each entry is separated by a header with [Auto Setting-n], where 'n is the entry number, 1 to 100.

Once the versions are configured, select the "Auto Update Enabled" option from the auto menu. This can also be enabled via a command line option of "/Auto". This allows a separate program to build the list and run the program as a sub-process.

There is also a "Prompt for Auto Download" option in the "Auto" menu. This will prompt with a Yes/No dialog whenever an automatic update is going to be performed.

## 1.7   Ping List

Version 2.0 and above support a "Ping List". This will send search requests to specific IP addresses. If a board is remote and is accessible via the Internet or LAN subnet, it can be searched for by IP address.

The ping list can contain an IP address or a DNS name. Entries are entered from the "Ping List" command in the "Search" menu.

Whenever a search is performed, a broadcast is sent to the local LAN. The search will find boards on the local segment, but it will not be seen past routers. Search requests are also sent to each IP in the ping list.

A file can be used. In the Ping list a entry:

File:filename.ext

Will have the program load the ping list from a separate file. The file is a text file with IP address or DNS names on a single line.

## 1.8 Search options

The UDPDownload.ini file has an option to disable the use of broadcasts. This is:

No Search = 1

1 for no broadcast, and 0 to broadcast a search to all local LAN addresses.

Version 2.1i has this option in the ping menu.

## 1.9    Accessing Remote Systems

If a device has a public IP, it can be accessed via the Internet. However,  if  it is behind a firewall or NAT router, it may not be accessible.  For the device to be accessible over the Internet, the firewall or router needs to forward UDP port 2000 to the local device.

# 2.0 Command-Line Mode

Version 2.2 and later supports the following command line parameters:

UDPDownload /IP=ipaddr /ROM=romfile.bin /RAM=ramfile.bin /Force

**Where:**
ipaddr - IP address to download to.
romfile.bin - ROM image to download. Can be file in the current directory or a full path.

**The following parameters are optional:**
ramfile.bin - RAM loader to download. Can be file in the current directory or a full path.
        not required if board has RAM loader in flash.
/Force - Force a RAM loader download (Requires /RAM= option).

The program will return non-0 if there is an error. It will also log to UDPDownload.log on any command-line download.

**Return values:**
0 - Success
1 - Windows error (cant create hidden dialog box.)
2 - /ROM not specified
3 -No boxes in list, run search first. (search failed.)
4 - Could not open program file
6 - Could not open RAM loader file