DMLOADER

In This Appendix...

Generate DMLoader Image

The Generate DMLoader Image utility is intended to be used by OEMs to help them handle updating the Do-more! PLC in machines that they have built. To that end, this utility is used to build a single file that contains any mix of the System Configuration, the Ladder Logic, the Documentation, the PLC's memory contents, and the PLC firmware of a Do-more! CPU. This file will then be used by DMLoader to update one or more Do-more! PLCs without having to use the Do-more! Designer PLC programming software.

> **NOTE:** *To generate a DMLoader image, you must be connected to a Do-more! PLC. The utility cannot generate an image from just the program file.*

After opening the Do-more! Designer project and establishing the online communication session with the Do-more! CPU, use the **File**-> **Export**-> **Generate DMLoader Image** menu selection to begin.

As you progress through the various selections, this utility will gather the required information from the currently open Do-more! Designer project and from the Do-more! CPU in the current online session. As you enable a selection you will be prompted for any additional information that is required by that selection.

DMLoader Image Passwords

The Generate DMLoader Image utility will maintain password protection to protect intellectual property in the image file and/or the CPU itself.

The **DMLoader Image Password** allows a password to be used on the image file that will be generated. DMLoader Image Passwords must be 4 to 8 characters in length with no embedded white-space characters. Passwords are also case sensitive. Leave this field blank if you DO NOT wish to include a password on the image file itself.

The **Comm Session Password** allows DMLoader to correctly handle CPUs with password protection enabled by requiring the destination CPU's password be included in the image file so that it can establish a communication session with the destination CPU. The password is encrypted when saved as part of the image file. Comm Session Passwords must be 4 to 8 characters in length with no embedded white-space characters. Passwords are also case sensitive.

Vendor Codes

The Generate DMLoader Image utility provides a way to use Vendor-supplied values to make sure that the updates are being downloaded to the correct destination CPU.

The **$ProductID** field contains an 8 digit Hex value. It can be set to operate in one of the following three ways:

- **Off** – download the image value regardless of the values in DST387 in the destination CPU.
- **Set** – overwrite the value in DST387 with the specified value regardless of the current value in that register location.
- **Require** – read the value is DST387 from the destination CPU and require that the value read from the CPU match the value specified before the image can be downloaded.

> **NOTE:** When you click Generate Image, a Warning message will be displayed if the value specified in this field does not match the value currently in DST387 of the source CPU. You should consider adding a rung of ladder logic to $tFirstScan that sets the $ProductID value so that this value is always in the expected location.

The **$ProductVersion** field also contains an 8 digit Hex value in the form of MMmmBBBB where MM is the major version, mm is minor version and BBBB is the build number. This field can be set to operate in one of the following three ways:

- **Off** – disregard this field.
- **Set** – set the value in DST388 to the specified value regardless of the current value in that register location.
- **Check** – read the value is DST388 from the destination PLC and compare that value to the value specified. These values are NOT required to match to allow the image to be downloaded. If the values do not match a message to that effect will be displayed.

> **NOTE:** When you click Generate Image, a Warning message will be displayed if the value specified in this field does not match the value currently in DST388 of the source CPU. You should consider adding a rung of ladder logic to $tFirstScan that sets the $ProductID value so that this value is always in the expected location.

PLC Operating System
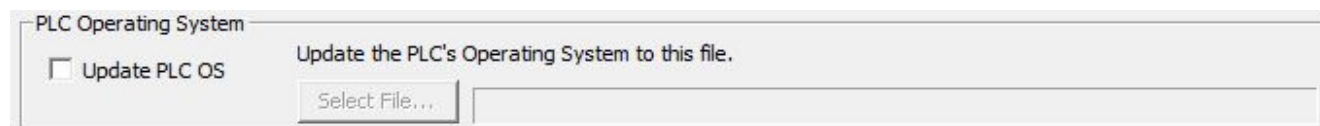
The Generate DMLoader Image utility can include a copy of the firmware that is currently running in the connected Do-more CPU so that DMLoader can update the destination CPU's firmware as part of the image download process.

At the time the **Update PLC OS** selection is enabled, the utility will read the current firmware version from the connected Do-more CPU and it will then search the Do-more Designer's firmware folders for the operating system firmware file that best matches the firmware version read from the CPU. The full pathname of the file that best matches will be displayed.

If no matching firmware file is found, or if you want to use a different operating system firmware file, click the **Select File** button to open a File Open dialog that will allow you to browse for a different operating system firmware file.

Program System Configuration, and Documentation
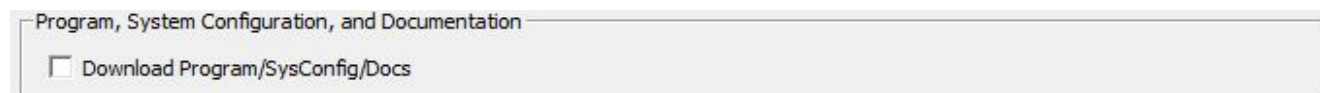
When the **Program System Configuration, and Documentation** selection is enabled the following parts of the currently open project will be included in the image:

- All of the Project's code-blocks, which include the System Programs and Tasks and all User Programs and Tasks.
- The System Configuration, which includes the following:
  - CPU Configuration (the TCP/IP configuration of the on-board port will NOT be included, the Destination's CPU's TCP/IP configuration can be done by DMLoader).
  - I/O Configuration

- – Module Configuration
- – Device Configuration
- – I/O Mapping
- – Memory Configuration
- All of the Project's Documentation, which includes the Element Documentation and the Rung Comments.

If this selection is NOT enabled, the Program, System Configuration and Documentation in the destination PLC will NOT be changed when DMLoader downloads this image file.

Retentive Memory Image

When the **Download Retentive Memory Image** selection is enabled a check is made to see if a retentive memory Image already exists for the project. If one exists its contents will be included in the DMLoader image.

If none is found you will be prompted to run the Memory Image Manager to create one. Upon returning to this utility you will prompted to include contents of the just-created retentive memory image in the DMLoader image file.

Password Configuration

Password Configuration
☐ Download Passwords   Password Configuration...
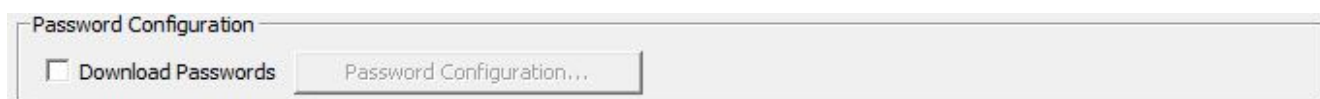
When the **Download Passwords** selection is enabled all of the User Account information will be included in the DMLoader image file.

If this selection is NOT enabled, the User Account information in the destination PLC will NOT be changed when DMLoader downloads this image file.

Vendor Banner and Update Instructions

User Provided Banner Bitmap
☐ Use Banner   This file will replace the banner bitmap displayed at the top of DMLoader. The preferred size is 690x65.
Select File...

User Provided Instruction File
☐ Use Instruction File   This file will replace the instructions displayed in the Welcome page of DMLoader.
Select File...
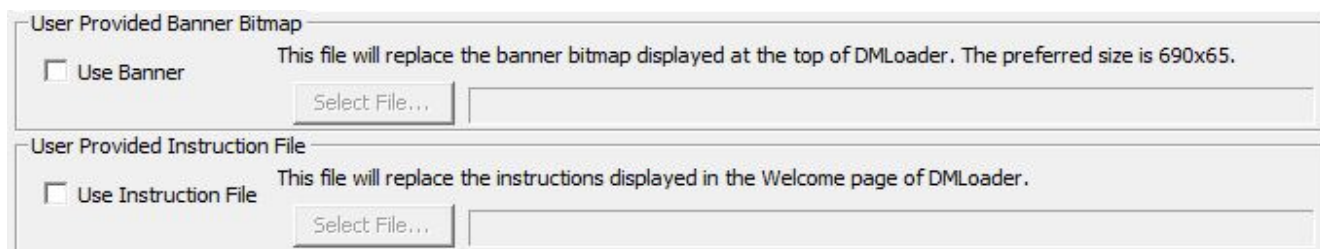
These two fields allow the user to supply a vendor-specific banner graphic and/or vendor-specific system update instructions that will be displayed in DMLoader when it opens this image file.

The banner is a 690 x 65 pixel BMP image that is centered in the top section of DMLoader when it opens this image file. When the **Use Banner** selection is made the **Select File** button is enabled which will open a dialog where the user can browse for the BMP file that will replace the default graphic. The selected file will be added to the image file at the time it is selected.

The area circled in red in the image below is the banner area of DMLoader. The user-supplied banner will be centered in that area. If the user-supplied banner is too large for the area it will be clipped, it will NOT be resized to fit.

The instruction file is a text file that will displayed in the bottom section of the initial screen of DMLoader when it processes this image file. This instruction file can contain written instruction that the operator will use when using DMLoader to update a CPU.

When the **Use Instruction File** selection is made the **Select File** button is enabled which will open a dialog where the user can browse for a TXT or RTF file that will replace the default instruction file.

The area circled in red in the image below is the instruction text area of DMLoader.
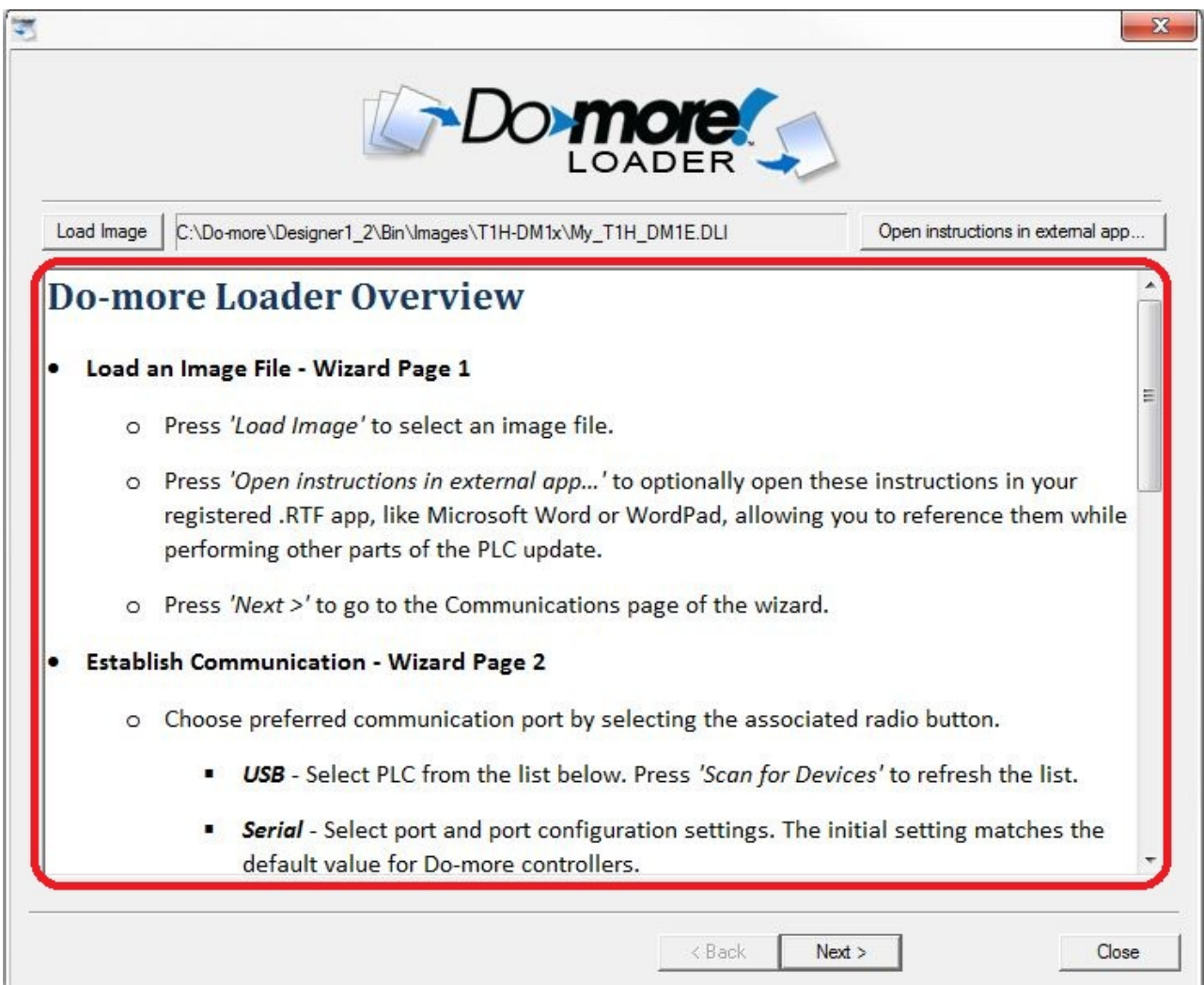
Generate the Image File

Click the **Generate Image** button when all of the desired selections are made to specify the file name for the DMLoader image file. When the file generation is complete the following dialog is displayed which gives you the following options:
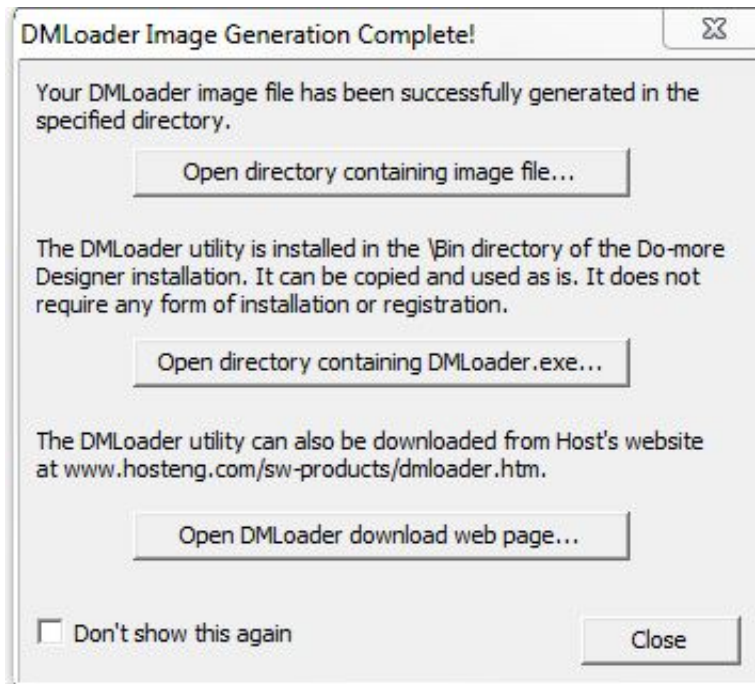

Open directory containing image file – will open a Windows Explorer instance of the directory where the newly generated image is stored and the image file itself will be highlighted. This useful if you need to access this image file at this point to distribute it.

Open directory containing DMLoader.exe – will open a Windows Explorer instance of the directory where the DMLoader.exe is installed with DMLoader.exe highlighted. This useful if you need to access this utility to distribute it.

Open DMLoader download web page – will open a web browser instance pointing to the location on the Host Engineering website where an installable version of DMLoader is located. The URL is www.hosteng.com/sw-products/dmloader.html.

Close – if you are done with this utility.

Click the **Don't show this again** option to prevent this dialog from appearing the next time you run the Generate DMLoader Image utility.

DMLoader—Do-more! Loader

The DMLoader utility will use an image file built by **Generate Do-more! Loader Image** in the Do-more! Designer software to update a Do-more! CPU with the contents of that image file. DMLoader can use a USB, Serial, or Ethernet connection to the destination Do-more! CPU to perform the update.

DMLoader has its own website that you can use to download the utility: www.dmloader.com.

When DMLoader opens, you will be prompted for the DMLoader image file to open. If the image file was created with a password, you will be prompted to enter that password before the file can be opened.

After an image file is selected and successfully opened, the main DMLoader dialog will be displayed. The image below has the default Do-more! Loader banner at the top and the default instructions in the bottom section. If the image was created with custom banner and/or instructions these would be displayed instead.

Click the **Load Image** button to open a different DMLoader image file.

Click the **Open Instructions in external app** button to open the instructions in the computer's default application for .RTF files; this could be Notepad, Wordpad, Microsoft Word, etc. This allows you to have the instructions available on-screen when you move to the next section of the DMLoader process.

Once the correct image file is open, and the instructions are where you want them, click the **Next** button move to the next section.
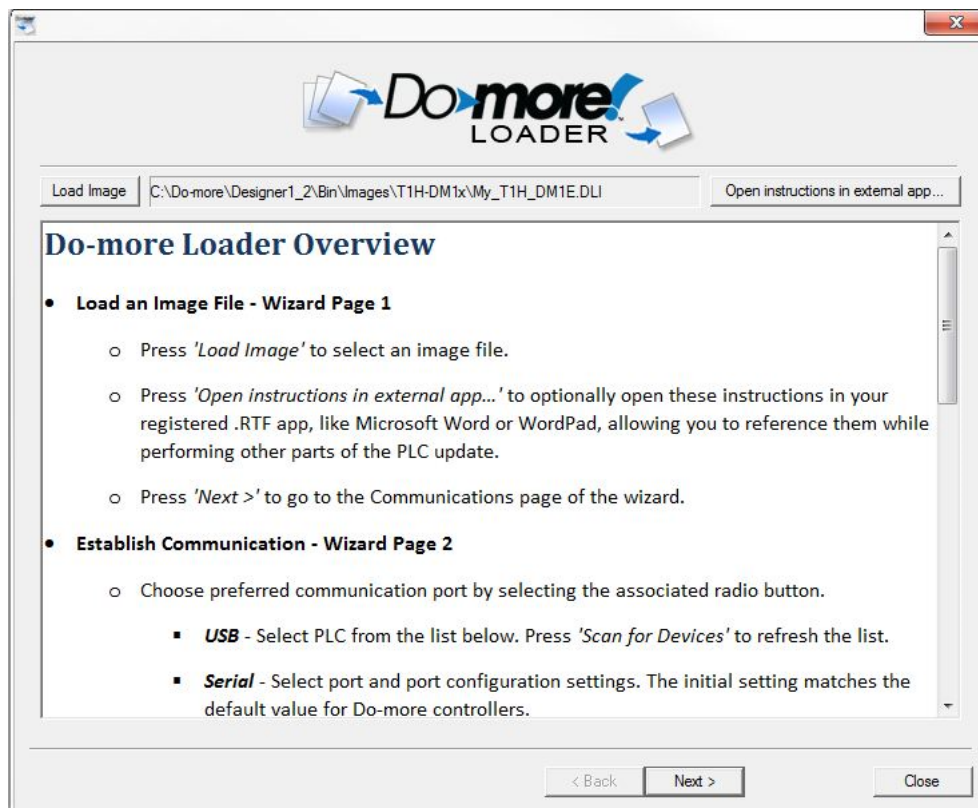

Establish Communication Link to the Destination CPU

This section of the dialog will establish the required communication link to the destination CPU. You can elect to use the USB or Serial or the Ethernet port (if available) on the destination CPU to establish the communication link. Once the connection port is selected and configured (if necessary) then click the

Test Link to Continue button to verify that the link is functional before you can continue to the next section where the update will be performed.
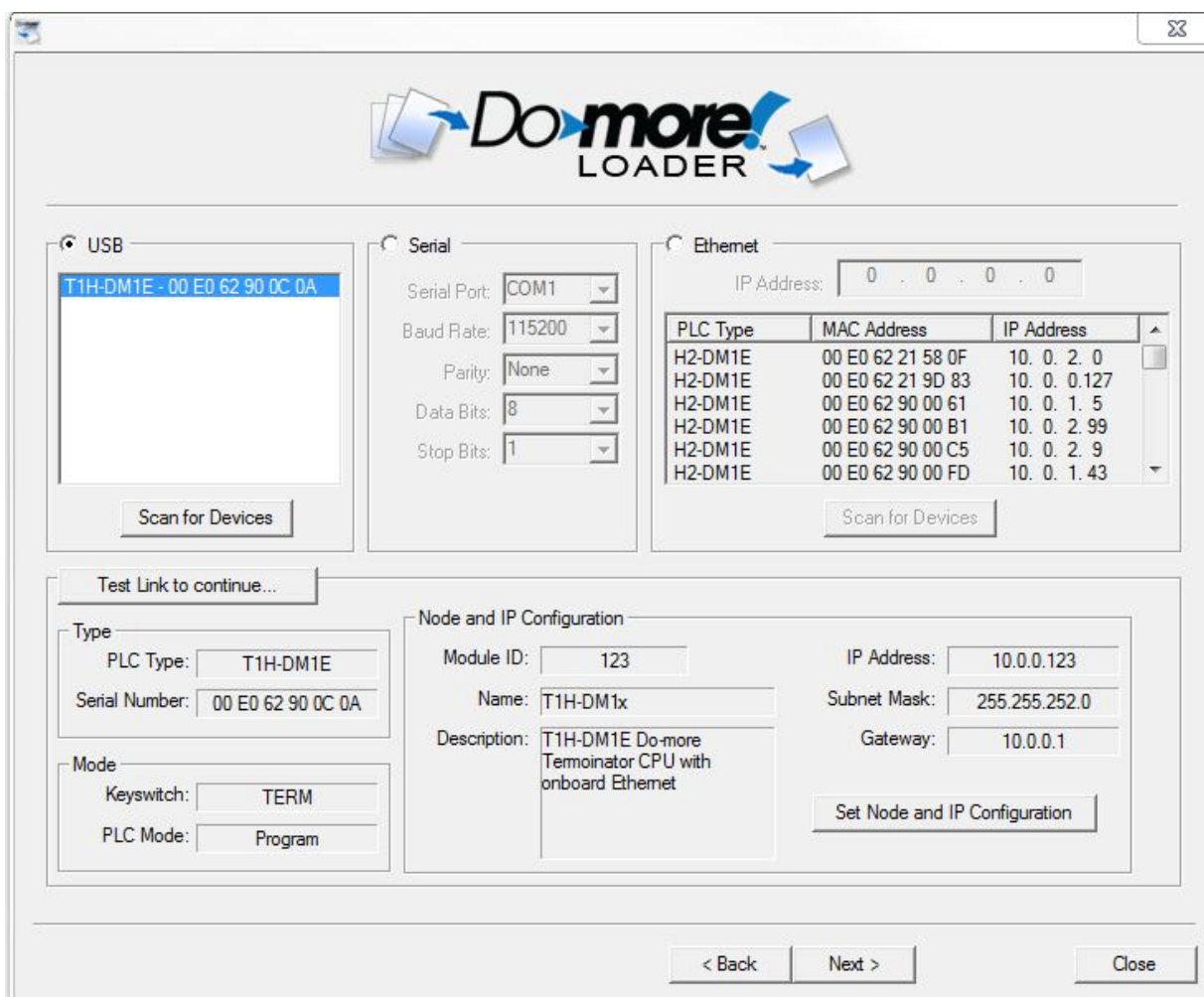
Step 1: Select the communication port to use

USB – select this option to use the USB port to perform the update operation. If the USB cable was connected when DMLoader was started, the destination CPU's USB address will already be in the list of USB devices found. If multiple Do-more! CPUs are displayed highlight the one you want in the list.

> **Scan for Devices** – click this to re-scan the USB port to find a newly connected Do-more! CPU.

> **NOTE:** If the connected Do-more! CPU is NOT in the list of USB devices after a re-scan operation make sure that no other application, such as Do-more! Designer, is currently using that USB connection to the CPU.

Serial – select this option then provide the following:

> **Serial Port** – will list the serial ports that are configured on this computer, for example: COM1, COM2, etc.

> **Baud Rate** – 115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200, 300

> **Parity** – None, Odd, Even

> **Data Bits** – 5, 6, 7, 8

> **Stop Bits** – 1, 1.5, 2

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Ethernet – when this option is selected, DMLoader will query the network for Do-more! CPUs that are currently connected to the network. If the destination CPU is new (and does not have a TCP/IP configuration) or has an incorrect TCP/IP configuration, this can be addressed in the next step.

Select the desired destination CPU from the list and it's currently configured IP address will be displayed in the **IP Address** field.

Scan for Devices – to perform the network query to scan for Do-more! CPUs.

Step 2: Test the communication link to verify connectivity

After the port has been selected, click **Test Link to Continue** to validate the communication link. If the validation process is successful DMLoader will read the following information from the attached Do-more! CPU:

Type – displays the type of controller hardware and identification

PLC Type – displays the type of controller hardware

H2-DM1 – DL205 Series Do-more! controller

H2-DM1E – DL205 Series Do-more! controller with on-board Ethernet

T1H-DM1 – Terminator I/O Series Do-more! controller

T1H-DM1E – Terminator I/O Series Do-more! controller with on-board Ethernet

DM-SIM – Do-more! Simulator

Serial Number – the 12 digit serial number of the controller

Do-more! controllers without on-board Ethernet – this is a serialized number assigned at the factory

Do-more! controllers with on-board Ethernet – this is the MAC address of the Ethernet port

DM-SIM – this is the MAC address of the primary Ethernet adapter in the PC running the Do-more! Simulator

Mode – displays the current PLC mode information

Keyswitch – the current position of the front panel keyswitch

RUN – the keyswitch is in the RUN position

TERM – the keyswitch is in the TERM position

STOP – the keyswitch is in the STOP position

PLC Mode – displays the current PLC mode

Run – the controller is running the project

Program – the controller is not running the project

Optional Step 3: Setting up the TCP/IP configuration for a Do-more! CPU that has an on-board Ethernet port

Node and IP Configuration – displays the current Node configuration and the setup of the on-board Ethernet port (on models that have them). These values are initially configured by the NetEdit utility. The values of the fields are also stored in the controller's memory in these locations: $IPAddress (DST18), $NetMask (DST19), $Gateway (DST20).

Click the **Set Node and IP Configuration** button to open a dialog that will allow you to change these entries.

> **NOTE:** *The ability to change the TCP/IP configuration of a Do-more! CPU through its USB or Serial port is a convenient way to set the TCP/IP configuration of a controller that is not configured to be part of the local network.*

Module ID – the ID can be any positive constant number

Name – the Name can be any 255 character combination of alphanumeric and punctuation characters. The Module ID and Names entered must be unique on the network where the controller will be connected.

Description – the Description can be any 255 character combination of alphanumeric and punctuation characters.

The TCP/IP Address information entered in the following three fields must be valid for the network where the controller will be connected. For Do-more! controllers that do not have an on-board Ethernet port these fields are not used for configuration purposes, but the data in these fields can still

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be used for identification by storing values in their associated status memory locations: $IPAddress (DST18), $NetMask (DST19), $Gateway (DST20).

IP Address – can be any valid TCP/IP Address The IP Address entered must be unique on the network where the controller will be connected

Subnet Mask – can be any valid TCP/IP Subnet Mask

Gateway – can be any valid TCP/IP address of a network Gateway

After the communication link is established click the Next button to move to the final section where the update is performed. At this point a final check is made of the communication link to make sure that the on-screen selections still are still valid for the Do-more! CPU that is physically connected. If at this point the connected CPU does not match the on-screen selections an error message similar to the following is displayed:
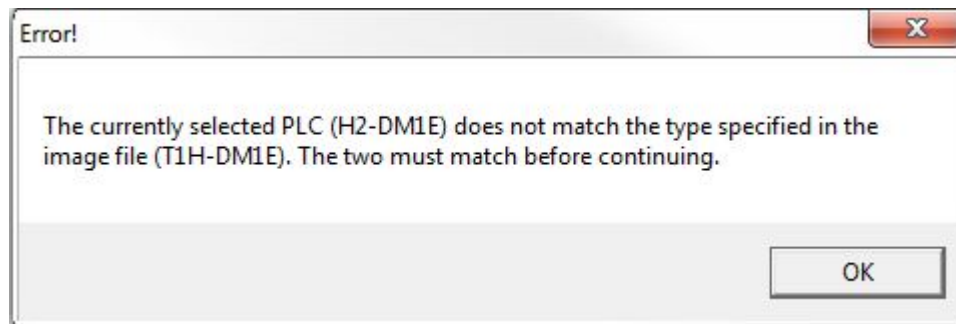
Perform the Update

The final step is the actual downloading of the image contents to the destination CPU. The left-side control will display a list of the operations that will be performed based on the contents of the image file that was opened. The right-hand control will display the log entries generated by each step of the update process.

Click the **Start Update** button to begin the update process, the current step in the process and a progress indicator for that step are displayed to the right of the button.
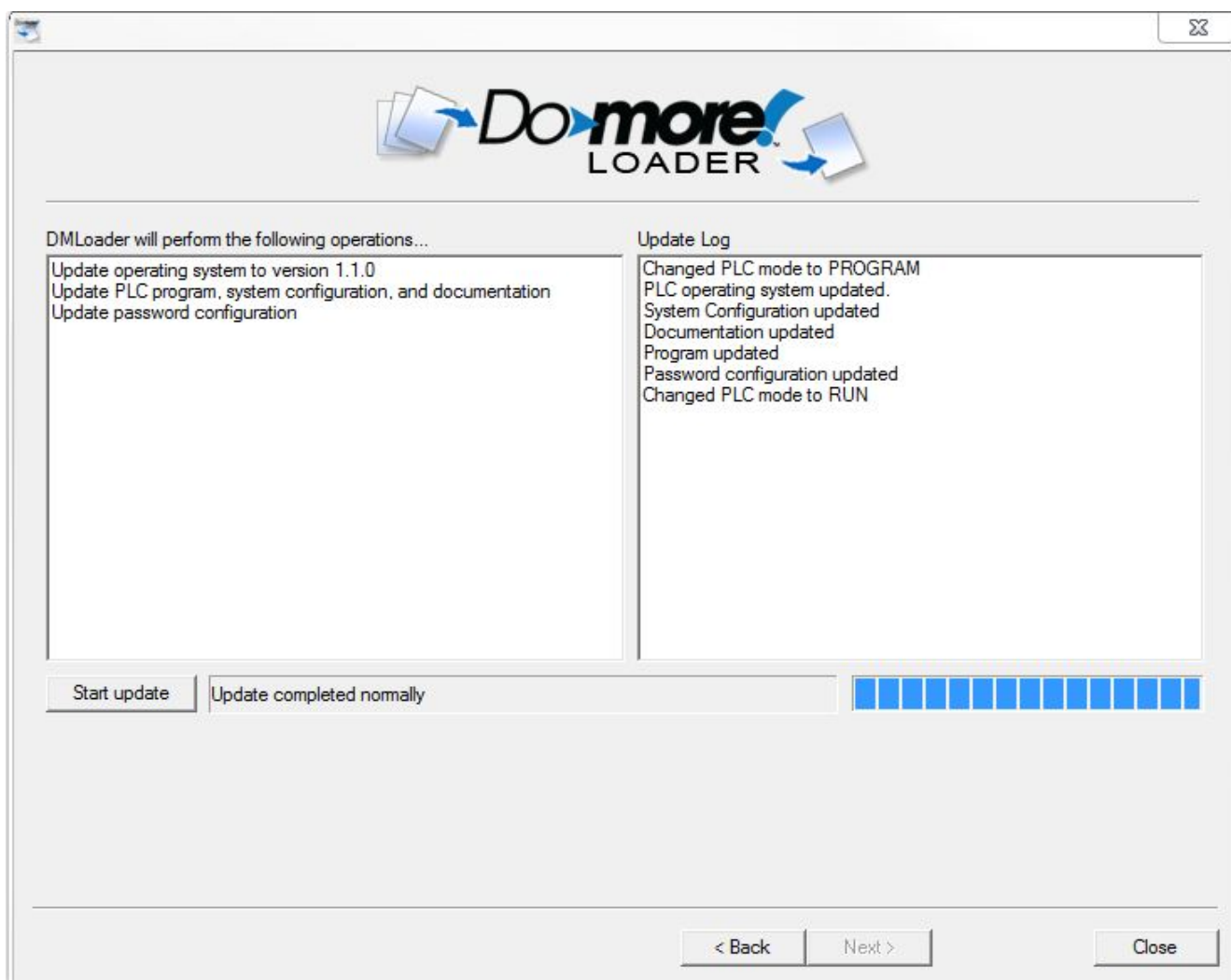
Once the update process concludes, you can use the **Back** button to return to the previous step and select a different Do-more! CPU to update, or click **Close** to exit DMLoader.

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