



# **CANLink<sup>®</sup> Downloader<sup>™</sup> USER'S MANUAL**

V02

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**FULL TEXT OF THE CANLink<sup>®</sup> Downloader<sup>™</sup> LICENSE IS INCLUDED WITH THE SOFTWARE**



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## *General Information*

### **SOFTWARE INSTALLATION**

Refer to the CANLink® Orchestra™ Software Installation Manual for system requirements and for procedures on how to install the CANLink Downloader software.

## MAIN WINDOW

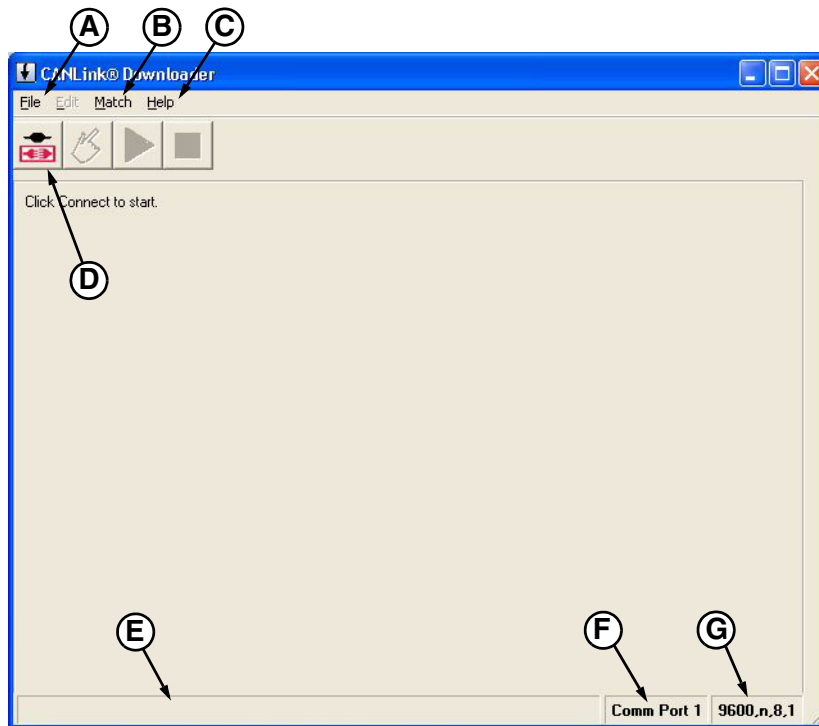


Figure 1

### Program Menu

#### (A) File

Use this menu to connect to the Master Module, select Comm Port, or Exit the application.

#### (B) Match

Use this menu to change how modules are grouped in the display after connecting.

#### (C) Help

About the Downloader

### Tool Bar Buttons

#### (D) Connect

Use this button to connect to the Master Module.

### Status Bar

#### (E) Progress Bar

Displayed during *Connect* and *Module Query* only.

#### (F) Comm Port

Displays current port number selected.

#### (G) Serial Communication Parameters

Displays baud rate, parity, bits per byte, stop bits.



## Quick Start

### GENERAL INFORMATION

The Downloader transfers Program Files from the connected computer into CANLink modules that are connected via USB, RS-232 or modem connections. After the initial install, the Downloader defaults to use COM1 port. Change the port under the File menu option *Connect Using...* (see *Changing the Port on page 5*). When the port is changed, the Downloader saves setting as the default to use the next time the Downloader runs.



When the Downloader connects, it enters either of two modes, depending upon the Master Module firmware. If the Master Module supports module version reporting then the Downloader enters Module Versions Mode; otherwise it will enter the Legacy Mode.

In Module Versions Mode the Downloader displays a list of known modules and versions. The user may select any or all of them and then initiate download. The Downloader determines which Program Files to send by using its database of module types.

In Legacy Mode the user works with one module type at a time. The user selects which Program File to download to a module type that is also entered by the user.

### Quick Start - Module Versions Mode

The download procedure is simple, requiring a few key strokes or mouse clicks, as follows:

1. Click the  *Connect* button to establish communication with the Master Module.
2. Choose which module(s) to program.
3. Click the  *Start* button.

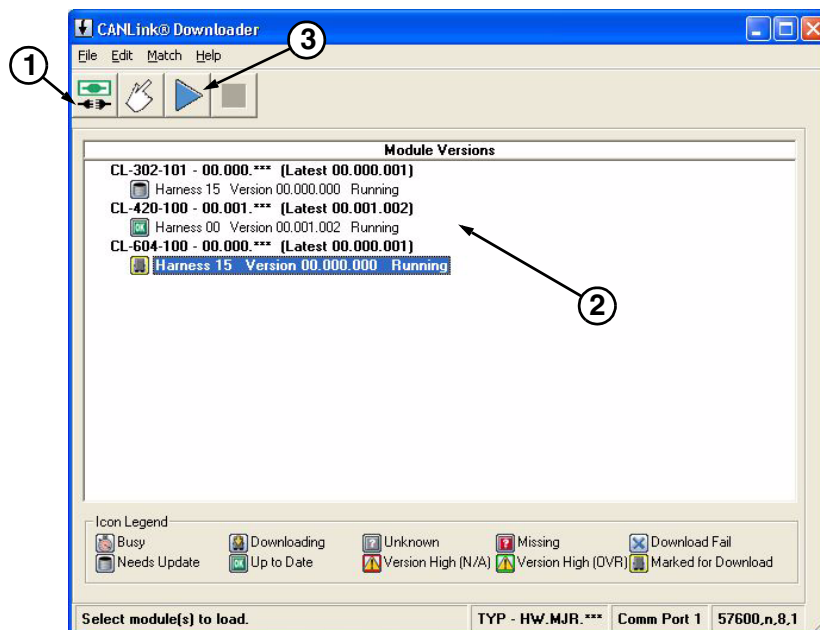


Figure 1



Select any or all of the modules that are connected to the Master Module. Press *Start* and the Downloader does the rest. The Downloader uses its predefined database to determine which application file should be sent to each Module Type and automatically downloads the appropriate code.

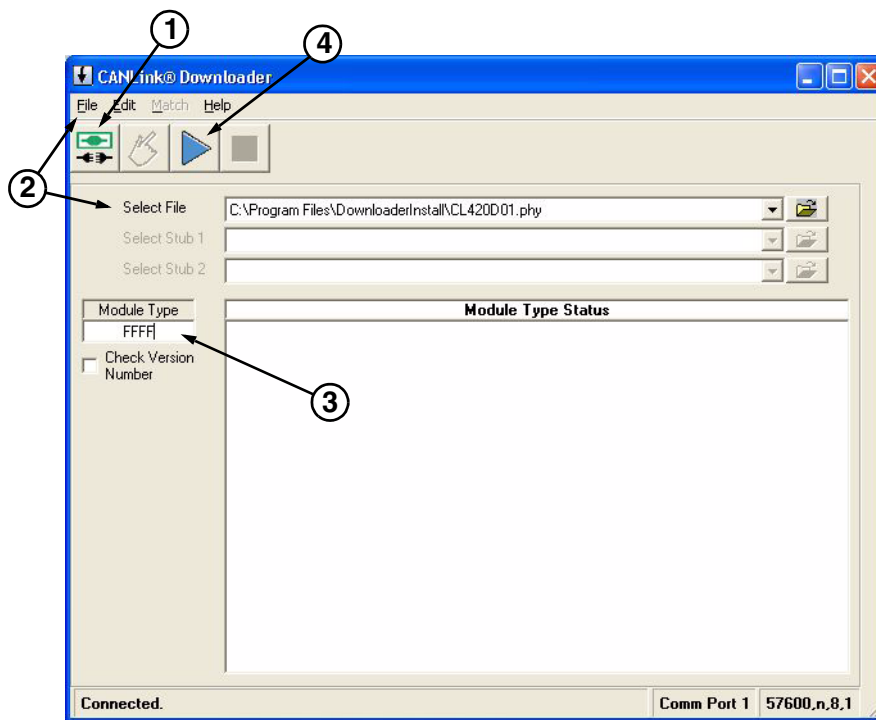
### Quick Start - Legacy Mode

If the Master Module has older firmware that does not report module types and versions, then the Downloader connects in Legacy Mode. In Legacy Mode, the user must specify which file to download for each Module Type.

*Note: Module Type is a four-digit hexadecimal value that the OEM supplier can provide. The Master Module is always identified as Module Type: FFFF.*

Here are the steps to download in Legacy Mode:

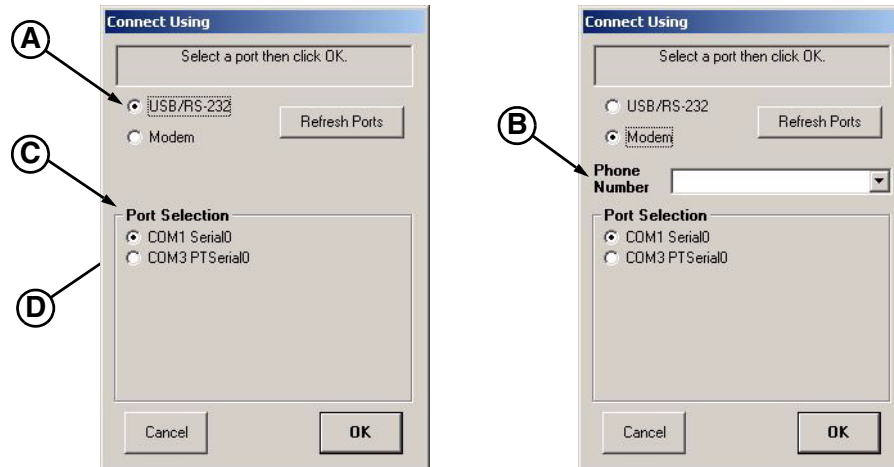
1. Click the  *Connect* button to establish communication with the Master Module.
2. Use the Downloader's *File>Select File* dialog box or *Select File* file history dropdown list to identify the path and filename of the Program File to download.
3. Enter the 4-digit Module Type of the module(s) that should receive the code from the selected file (**FFFF** for the Master Module).
4. Click the  *Start* button.



**Figure 2**

If the Downloader connects in Legacy Mode, then consider first upgrading the Master Module with the latest firmware. Thereafter, any updates to the remaining modules will use the three-step procedure outlined in *Quick Start - Module Versions Mode* on page 3.

## Changing the Port



**Figure 3**

Before connecting, configure the Downloader to use the appropriate port. The port can be configured from the **File** menu. Select *Connect Using...* to see the **Connect Using** window that lists the connection options. The following is a detailed description of the **Connect Using** window.

### Port Type

In the upper part of the window are located two option buttons (**Figure 3, A**) that specify whether the computer is connected locally through a USB/RS-232<sup>1</sup> port or remotely through a Modem. If the Modem option is chosen, then a Phone Number dropdown list (**Figure 3, B**) appears below the *Port Type* option buttons. In the Phone Number dropdown list enter or select a telephone number to dial. When a new number is entered, the Downloader stores the number and adds it to the dropdown list. The *Port Type* selection and the last number used will become the defaults for the next time the Downloader is used.

### Port Selection

In the lower part of the window is the *Port Selection* list (**Figure 3, C**), which will specify which port is connected to the Master Module. The *Port Selection* list displays an option button (**Figure 3, D**) for each serial port on the connected computer. The buttons are labeled as COM<number> and device name. For example: COM1 Serial0. If a port is currently open (for instance, by another application) then its corresponding button is displayed in the disabled state.

The Port Selection list gets updated dynamically. If a USB connector or other such removable serial port connector is connected or disconnected from a module, the change shows up immediately in the Port Selection list. Press the *Refresh Ports* button to refresh the list.


Press *OK* to save the change(s) and close the **Connect Using** window, or press *Cancel* to close and return to the original settings. If using a modem, the Downloader does not dial until *Connect* is pressed on the **Main** window.

<sup>1</sup> If using a USB connection, install a driver that emulates an RS-232 port. Contact the OEM supplier of the module to obtain the appropriate driver.

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## Module Versions Mode

### OVERVIEW

When the  *Connect* button is pressed, the Downloader establishes communication with the Master Module and requests version details about all the modules. When the Master Module responds to the request, the Downloader organizes the modules according to their types and versions and displays them on the screen in groups. Within each group the modules are sorted by harness code.

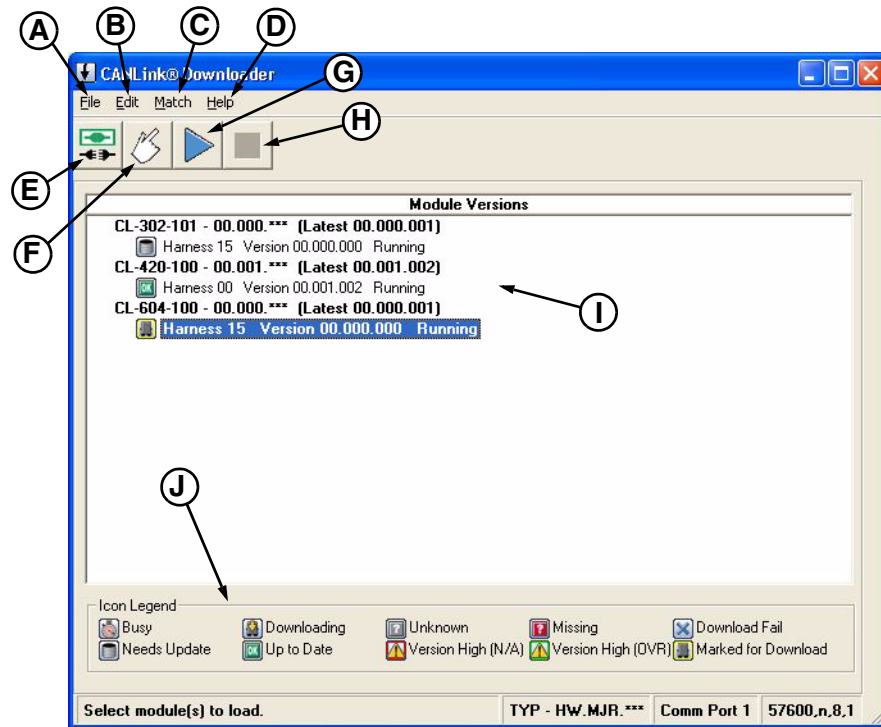


Figure 1

### Program Menu

#### (A) File

Use this menu to close the connection with the Master Module, or exit the application.

#### (B) Edit

Use this menu to *Select/Deselect All* listed modules at once, *Start* or *Stop* downloads, or *Re-query Modules* and refresh the display.

#### (C) Match

Use this menu to change how modules are grouped in the display for receiving downloaded code.

#### (D) Help

About the Downloader

## Tool Bar

(E)  **Disconnect**

Use this button to close the connection with the Master Module and return to the **Main** window.

(F)  **Select/Deselect All**

Use this button to select or deselect all listed modules.

(G)  **Start**

Use this button to start the download.

(H)  **Stop**

Use this button to stop the download before completion.

(I) **Module Versions List**

Displays modules connected to the Master Module. Modules are grouped by Module Type, Hardware and Software versions.

(J) **Icon Legend**

Clarifies meaning of icons shown next to modules.

## General Version Format

Within the Module Versions list, the Downloader displays versions in a general format. The general version format is HW.MJR.MNR, where the definitions of its subfields are:

HW = Hardware Version

MJR = Software Major Version

MNR = Software Minor Version

For example: 01.002.020 would indicate Hardware Version 01, Software Major Version 002, and Software Minor Version 020.

## PROGRAM MENU

### File Menu

The File Menu is used to open or close the connection with the Master Module, or exit the application.

*Note: With this release of the Downloader software, the **Connect Using...**, **Select File** and **Reset File History** menu choices are not active features at this time and will remain grayed out.*

### Edit Menu

The Edit Menu is used to *Select/Deselect All* listed modules at once, *Start* or *Stop* downloads, or *Re-query Modules* and refresh the display.

### Match Menu (Advanced Topic)

Use this menu to change how modules are grouped in the display for receiving downloaded code.

The displayed grouping of modules is based on matching all such modules that have the same Module Type, Hardware Version, and Software Major Version. The Downloader provides a means to change the grouping by overriding version matching criteria. This may need to be done in order to accommodate unusual circumstances. For instance, should the OEM supplier recommend upgrading older modules having a lower Software Major Version to the latest Software Major Version, you will need to override Software Major Version matching. Do this using the *Match* menu to tell the Downloader to ignore Software Major Version when assigning the groups.

The Match menu has the following options:

#### **Module Type, Hardware, Major, Minor < Latest**

This is the installation default setting. Under this option all modules having the same Module Type, Hardware Version and Software Major Version shall be grouped together. Modules that have Software Minor Version less than the latest (i.e., highest) Software Minor Version found in the database for that group are selectable for download. Those with Software Minor Version equal to or greater than the latest are not selectable.

#### **Module Type, Hardware, Major**

This selection groups all modules having the same Module Type, Hardware Version and Software Major Version. No restriction is imposed upon Software Minor Version. This option effectively overrides Software Minor Version, thereby allowing downloads to modules that are already up-to-date or that have a higher Software Minor Revision than the latest revision found in the database for the group.

#### **Module Type, Hardware**

Groups all modules having the same Module Type and Hardware Version. Downloads the highest Software Major and Minor Version found for the given Hardware Version of that Module Type, overriding all software versions.

#### **Module Type**

Groups all modules having the same Module Type, without regard to Hardware or Software versions. Downloads the highest Software Major and Minor Version found for the given Module Type, regardless of Hardware Version.

To override the Software Major Version click *Match*, and then select Module Type, Hardware. Under this *Match* option, Software Major Version and Software Minor Version will be ignored. All modules having the same Module Type and same Hardware Version will be grouped together, regardless of Software Major Version or Software Minor Version. When this group is selected for download, all modules in the group will be designated to receive the same code. The code to be downloaded would have the highest Software Major Version or Software Minor Version found in the database for the given Module Type and Hardware Version.

The Downloader saves the *Match* setting to be used as the default the next time the Downloader runs.

*Note: The last option in the Match menu, "Module Type," is a special case that requires a password (Figure 2) from the OEM supplier because of the potential for harm in loading the wrong firmware. The Downloader disallows using "Module Type" as a default setting for the next time the Downloader is run and instead reverts to the installation default, "Module Type, Hardware, Major, Minor < Latest."*



*Figure 2*

## Help Menu

The Help Menu will display information about the Downloader software such as software version. This menu will automatically disappear after three to five seconds of display.



## MODULE VERSIONS LIST

The items in the Module Versions list include two types: Group headers and module entries. They are formatted as follows:

### Group Headers

Group headers are shown in bold type. A group header appears above the group of module entries that it represents. The format of the group header includes the following information:

**<Module Type Name> – <Matching Version> (Latest <Latest Version>)**

For example: “CL-103-101 – 00.001.\*\*\* (Latest 00.001.020).”

Where:

CL-103-101 = Module Type Name

00.001.\*\*\* = Matching Version

00.001.020 = Latest Version in the database for those modules

The Matching Version reflects the *Match* setting. In this case it shows that the modules having the same Hardware Version (00) and the same Software Major Version (001) shall be included in this group, and that the Software Minor Version is wild-carded to permit any value. The Latest Version shows the final general version that all the selectable modules in this group should reflect after programming.

### Module Entries

Module entries appear in normal type unless the group is selected for download. The entries are shown in bold type when selected. The format of the module entries includes the following information:

**Harness <Harness Code> Version <Hardware>.<Software Major>.<Software Minor> <Status>**

For example: “Harness 00 Version 00.001.001 Running.”

### Module Status

The example (**Figure 1**) shows that the module status is *Running*. A module can have one of three states reported in the *Status* field:

- Running - The module is connected and active.
- Missing - The module is not communicating with the Master Module.
- Unexpected - This is an extra module that the Master Module detected.

## Module Selection

Use either the mouse or the keyboard to select modules in the displayed list.

### Selection by Mouse

If using the mouse, then click on any module entry or the module group title. Regardless of whether selecting a module or module group title, all modules in that group will become selected.

### Selection by Keyboard











If using the keyboard, move the selection highlighting up and down by using the Up/Down arrow keys, and use the Enter key to select. When using the keyboard arrows, the highlighting jumps from one module group title to the next, skipping the individual module entries for faster scrolling.

### Select All Button

- When all modules are selected (i.e., marked for download), the *Select All* button deselects all modules.
- Otherwise, the *Select All* button selects all modules.

## Icon Legend

Next to each item in the Module Versions control, the Downloader displays an icon that indicates the status of the item. Below the Module Versions control is an icon legend for quick reference to understand their meanings. Here is a detailed description of the icons:

-  “Busy” - Appears next to a module group item after *Start* is pressed. Indicates that the Downloader is actively downloading to that module group.
-  “Downloading” - Appears next to modules after *Start* is pressed. Indicates which modules are currently receiving the download.
-  “Unknown” - Indicates that the module was not found in the database. Contact the OEM supplier for an update to the database and firmware files.
-  “Missing” - Indicates that the Master Module expected to find the module on the network but it is missing or not responding.
-  “Download Fail” - Attempted download failed, leaving the module in an uncertain state. To troubleshoot, check physical connections, check harness codes, cycle module power, and try again.
-  “Needs Update” - The module has a lower version than the version found in the database. It is selectable to mark for download.
-  “Up to Date” - The Module Version matches the version found in the database. Though its group may be selected, the module shall not be designated for download unless the *Match* criteria selection excludes Software Minor Version.
-  “Version High (N/A)” - Module Version is higher than that found in the database. Though its parent group may be selected, the specific module shall not be designated for download unless you override whichever version element is too high by using the *Match* criteria.
-  “Version High (OVR)” - Module Version is higher than in the database. The *Match* setting is overriding the version restraint so that the module shall be marked for download anyway if selected.
-  “Marked for Download” - Module is selected and designated to receive update when download begins.

## Legacy Mode

### OVERVIEW

The Downloader enters into Legacy Mode when connected to a Master Module having older firmware that does not report module types and versions. In Legacy Mode, manually locate and select the application file to download, and then enter which Module Type is to receive the file. Module Type is a four-digit hexadecimal value that OEM supplier can provide. The Master Module is always identified as Module Type: **FFFF**.

If the Downloader is in Legacy Mode, and the firmware in all modules is being upgraded, upgrade the Master Module first. Thereafter, all remaining modules will be able to be connected and downloaded from the Module Versions screen, which provides automatic file selection and Module Type entry. This approach is useful if all the Module Type codes for your modules are not readily available because only the Master Module Type code (**FFFF**) is required.

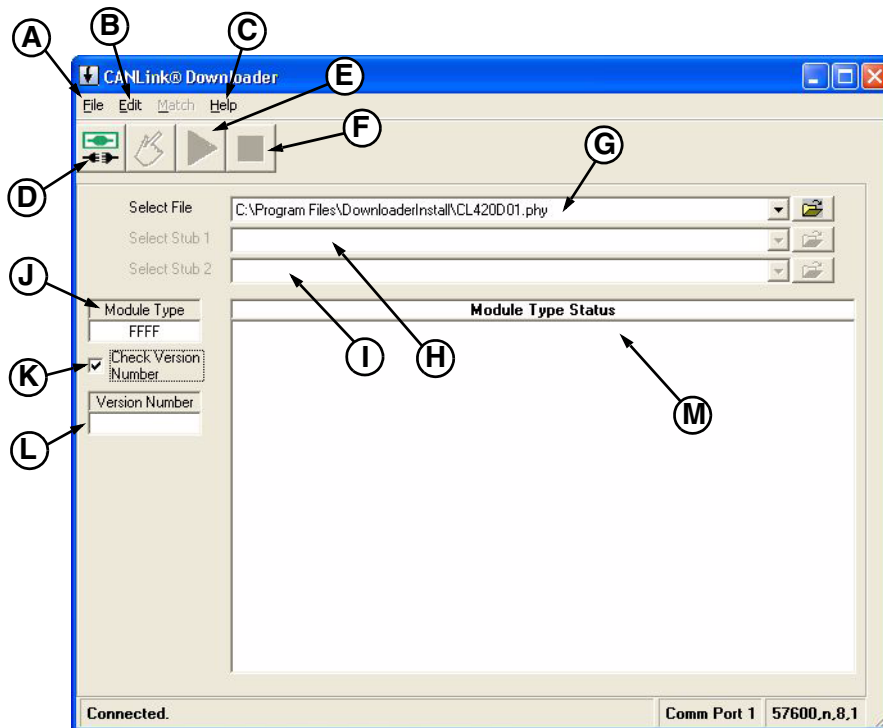


Figure 1

### Program Menu

#### (A) File

Use this menu to disconnect, select the file to download, clear the history of selected files, or exit the application.

#### (B) Edit

Use this menu to *Start* or *Stop* downloads.

#### (C) Help

About the Downloader

## Tool Bar

(D)  **Disconnect**

Use this button to close the connection with the Master Module.

(E)  **Start**

Enabled after both File and Module Type are filled in. Use this button to start the download.

(F)  **Stop**

Enabled during download. Use this button to stop the download before completion.

(G) **Select File (Ctrl+F)**

Use this to select the path and name of the file to download.

(H) **Select Stub 1**

Enabled during download if the module requires a *Stub 1* file.

(I) **Select Stub 2**

Enabled during download if the module requires a *Stub 2* file.

(J) **Module Type** (See *Module Type* on page 16)

(K) **Check Version Number** (See *Check Version Number* on page 16)

(L) **Version Number** (See *Version Number* on page 16)

(M) **Module Type Status** (See *Module Type Status* on page 16)

## Select File

To set up Legacy Mode for download, first select the appropriate file to be downloaded for the intended Module Type. The Downloader provides two ways to specify which file to send. Use the *File* dialog to locate the file on disk, or use the dropdown list to choose from a list of previously entered files. The *File* dialog can be opened by choosing *Select File* from the *File* menu or by clicking on the folder button located to the right of the *Select File* dropdown list.

When *Select File* is changed, the Downloader clears the Module Type to help prevent mistakes.

## Select Stub 1 and Stub 2

The *Select Stub 1* and *Select Stub 2* dropdown lists are disabled until the Downloader determines that a stub code is needed during the download (after *Start* is pressed). If stub code is needed, then the Downloader enables the appropriate dropdown list, prompts for the file, and then confirms the filename before proceeding.

## Reset File History

Every new file that is selected from the *File* dialog for *Select File*, *Select Stub 1* or *Select Stub 2* is added to its associated dropdown list for easier selection next time. If the Legacy Mode dropdown list contains too many obsolete entries, select the *File* menu option, *Reset File History*, to clear all entries and start over.

## Module Type

After filling in *Select File*, enter the Module Type code of the module to be programmed. Module Type is a four-digit hexadecimal number. As defined earlier, the Master Module is always **FFFF**. Contact OEM supplier to obtain the codes for other modules.

## Check Version Number

The *Check Version Number* check box is provided as an optional safety feature that prevents your module from receiving the wrong version of firmware. Unchecked (the default setting), the firmware file gets downloaded into the module without regard to the firmware version that it is replacing. Checking this box causes the *Version Number* text box to appear below the check box so that the version number can be checked.

## Version Number

When *Check Version Number* is checked, the Downloader displays the *Version Number* text box. Enter a two-digit hexadecimal number for the version of the file to be downloaded. After *Start* is pressed, the *Version Number* entered is compared with the firmware version of the module. If the firmware version of the module is less than the value entered, the download will commence. If the firmware version of the module is equal to or greater than the entered value, the download will be prevented.

## Module Type Status

At first connection to the Master Module, the Module Type Status control remains blank. After *Start* is pressed, the Downloader opens the selected Module Type and retrieves the status codes for all modules of that type, and displays all 16 harness codes for the given Module Type along with the status for each one. After the download completes, the Downloader updates the status codes and presents a message box to announce success or failure of the download. While the message box is displayed, the opportunity to review the updated status codes is possible before pressing *OK*, which then closes the connection and returns to the **Main** window.

Items in the Module Type Status control appear in the form:

Harness Code <HC> = <Status>

where HC is a two-digit decimal harness code (00 - 15).

Status can be one of:

- Not found – No module of given Module Type was found at this harness code.
- OK – Module Version matched, no need to download program.
- Needs program – Module Version is out of date.
- Failed program – Last attempted download failed.
- Passed – Download succeeded.

For example, before the download:

- Harness Code 00 = OK.
- Harness Code 01 = Not found.
- Harness Code 02 = Not found.
- Harness Code 03 = Not found.
- Harness Code 04 = Not found.
- Harness Code 05 = OK.
- Harness Code 06 = Needs program.
- Harness Code 07 = Not found.
- Harness Code 08 = Not found.
- Harness Code 09 = Not found.
- Harness Code 10 = Not found.
- Harness Code 11 = Not found.
- Harness Code 12 = Not found.
- Harness Code 13 = Not found.
- Harness Code 14 = Needs program.
- Harness Code 15 = Needs program.

After the download:

- Harness Code 00 = OK.
- Harness Code 01 = Not found.
- Harness Code 02 = Not found.
- Harness Code 03 = Not found.
- Harness Code 04 = Not found.
- Harness Code 05 = OK.
- Harness Code 06 = Passed.
- Harness Code 07 = Not found.
- Harness Code 08 = Not found.
- Harness Code 09 = Not found.
- Harness Code 10 = Not found.
- Harness Code 11 = Not found.
- Harness Code 12 = Not found.
- Harness Code 13 = Not found.
- Harness Code 14 = Passed.
- Harness Code 15 = Passed.

## *Final Notes*

### **END OF DOWNLOAD**

When the download ends, the Downloader updates the status information for the listed modules and then displays a message box that indicates whether the download was completed. The prompt will also ask whether or not to remain connected. Choosing *Yes* will cause the Downloader to hold the connection open, refresh the modules list once again, and then allows for further downloads. Choosing *No* will cause the Downloader to close the connection and return to the **Main** window.

In Legacy Mode, the Downloader cannot remain connected after a download, so the Downloader does not present that option. After a Legacy Mode download, the message box merely informs of success or failure. Press *OK* and the Downloader will disconnect from the Master Module and return to the **Main** window.

If using a modem, the Downloader also commands the modem to disconnect after it closes the connection to the Master Module.

### **EXITING THE APPLICATION**

Use the *Exit* option from the **File** menu, the *Close* button in the upper right corner of the window or the keyboard shortcut, Ctrl+Q, to exit the Downloader. If a download is in progress, the Downloader will prompt you to confirm whether you wish to exit. However, understand that interrupting a download abandons the open modules, leaving them with invalid firmware. Any modules that are open for download at the time the application exits shall require a completed download later, before they can enter service.

## *Company Information*

### **ADDRESS**

HED (Hydro Electronic Devices, Inc.)  
2120 Constitution Ave.  
Hartford, WI 53207

### **WEB SITE**

[www.hedonline.com](http://www.hedonline.com)



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