A Utility MProg for Loading Firmware into Microcontrollers

User Guide

Purpose

The MProg unit is designed for loading firmware into microcontrollers of terminators (Lift Unit (LU), Engineering Terminal (ET)) and nodal devices (Local Bus Controller (LCB), Junction Line Controller (JLC)) that offer support for loading the firmware.

Installation

The MProg utility is installed as part of the software application LMDS. The executable MProg.Exe is located in the Common folder.

Launching

The utility is launched by the LKDSDrv server configurator — LKDSDrvCfg.Exe for nodal devices, by selection of the respective menu item that drops on right-click, above the device image in the structure.

For lift units, the utility is launched from MPultPro.Exe on selection of the respective menu item that appears on right-clicking above the lift box in the Administrator mode.

The MProg utility can be also launched manually by specifying the required command-line options. The option set varies depending on the data provider. If the data arrives from the LKDSDrv server, the following options are used:

- -n<subnet_number>
- -u<nodal_unit_number>
- -s<slot_number>
- -a<LCB_bus_address>
- -c<computer_address>

The –n option defines the number of the subnet comprising the nodal unit that contains the device being programmed.

The –u option defines the number of the nodal unit comprising the device being programmed.

The –s option defines the slot number in the inter-unit interface taken by the device being programmed, or taken by the LCB to whose local bus the terminator (LU, ET) is connected.

The –a option defines the address on the LCB local bus of the terminator being programmed. If no option is set, MProg will handle the nodal device, the address of which in the LMDS network is defined by the options –n, –u and –s. If the –a option is set in the command line for launching the MProg utility, it will operate with a terminator the address of which in the LMDS network is defined by the options –n, –u, -s, and -a.

The –c option defines an address in the network of the computer where the LKDSDrv server is run, and through which the MProg utility will communicate with the hardware. If the LKDSDrv server is running on the same computer as the MProg utility, the –c option is not specified.

Examples of launching the MProg utility:

MProg –n0 –u1 –s7 –c192.168.2.53 => programming the nodal device included into Slot 7 of Nodal Unit 1 located in Subnet 0

MProg –n1 –u1 –s6 –a1 => of the lift unit that has an address on the local bus being equal to 1, with the local bus connected to the LCB in Slot 6 of Nodal Unit 1, and the nodal unit is in Subnet 1.

If the data arrives from the LKDSPro service, the following options are used:

- -r<index_LU>
- -c<computer_address>

The –r option defines the index of a lift unit in the LKDSPro service configuration. The LKDSPro service is configured with the module LKDSProCfg.Exe.

The –c option defines an address in the network of the computer where the LKDSPro service is run, and through which the MProg utility will communicate with the hardware. If the LKDSPro service is running on the same computer as the MProg utility, the –c option is not specified.

Using the Utility

Upon launching, the MProg utility detects the devices specified in the command-line options and finds out if firmware can be loaded into it. If the device is not found, or if it does not support a remote uploading of firmware, the utility is terminated with a respective message. If the MProg utility establishes that uploading is possible, the current parameters are read out of the device, and a dialog form similar to that shown below is displayed:

The above example demonstrates the status of memory pages in the LCB located in Slot 6 of Nodal Unit 0, Subnet 0. An active firmware is loaded into the first page, i.e. it is currently running.

A device that supports remote upload of firmware can have up to 8 variable memory pages, each storing a single firmware, with the information on which displayed in a single line of the panel. There is also a standard firmware that is loaded during device manufacture. The information on it is displayed in the Loader line. The Loader can be neither removed nor modified.

The button Refresh is designed for re-reading the current status of memory pages in the device.

The attribute that stands to the right of the line heading shows which utility is currently active, i.e. running in the microcontroller of the device.

The File size column shows the length of the utility image in bytes, if the utility is loaded into the memory page, or the current status of the page.

If the File size field displays the "Empty" value, the page is ready for loading the firmware, which can be effected by pressing the button Load located to the right in the page line. The files containing the images of uploaded firmware should be placed into the BIN folder

located in the same folder as the MProg.Exe file. On clicking it, a file selection dialog panel with the image of the firmware to be uploaded opens:
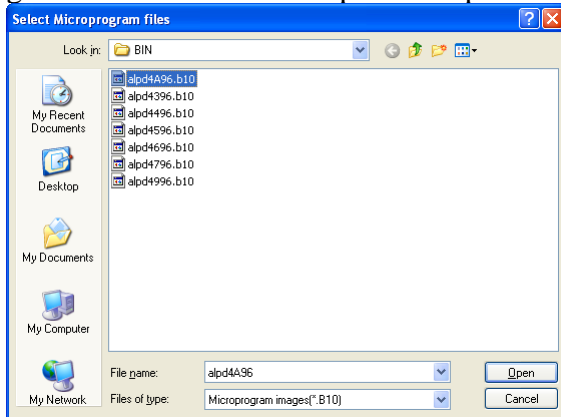
ATTENTION! The panel displays only the programs available for writing into the device.

On selecting the file being uploaded in the suggested list and pressing the Open button, we start the process of uploading. After that, the File size field displays the progress which is expressed as the number of total fragments versus the number of already loaded ones:
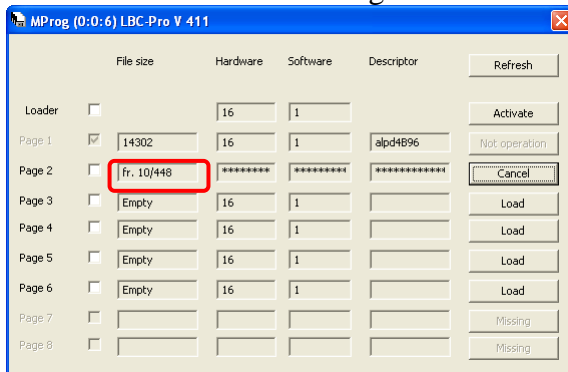

Uploading into the first page is in progress. 10 fragments of 448 are uploaded.

During the upload, the label "Load" on the button will change to "Cancel", which allows canceling upload into the given page.

The firmware can be uploaded into an arbitrary number of pages. To do that, press the Load buttons on other pages.

In case the upload into page 1 is successful, the dialog panel of MProg will look like this:
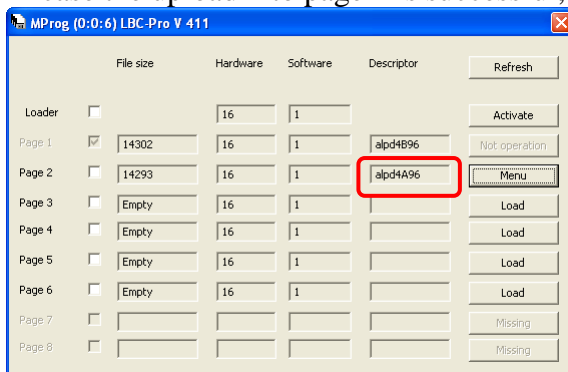
The alpd4A96 firmware has been successfully uploaded into page 2.

In the Descriptor field, a brief description of the uploaded firmware is displayed. In this example, it is alpd4A96. The label on the button will change to "Menu". Pressing the button will result in the display of a menu containing the two items:

1) Clear Page
2) Activate.

The Clear Page menu item allows reverting to the original status, i.e. the File size will display the "Empty" value, the page will be cleared, and the button will change its label to "Load". This allows for uploading another firmware into the page.

The "Activate" menu item launches a firmware uploaded into this page in the microcontroller. After that, the activity attribute for this page is set, and the button changes its label to "No operation" and becomes grayed-out, or inactivated, while the button of the previous active page (in our case, it is "Page 1") becomes activated.
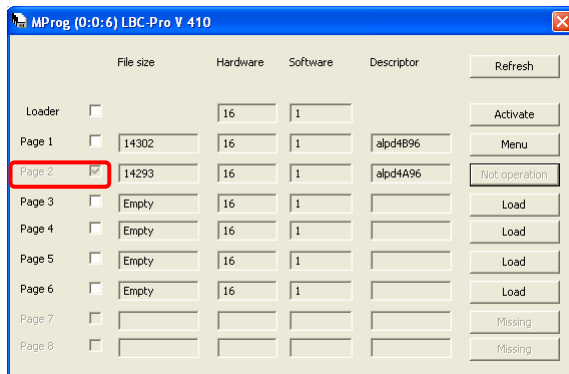
A firmware from the second page is run on the device.

The File size field may display the "Garbage" value, and the button changes its label to "Clear". By pressing the button, the page is cleared and prepared for uploading the firmware. This label may display on unsuccessful or aborted attempts to write into the given page.

The Hardware and Software fields display the numerical code of the type of firmware which can be uploaded into this device.

Firmware is loaded into lift units in the same manner.

It is possible to launch several instances of MProg simultaneously to both different devices and a single device. To protect memory pages against destruction caused by simultaneous actions from various instances of MProg, the first program MProg that handles a page blocks access to this page for other instances of MProg. It also protects against simultaneous incompatible actions; for example, an already uploaded page cannot be activated during upload of pages.

The MProg utility keeps a log of operation and errors in the MProg.Log file located in the same folder as the file MProg.Exe.