MultiMatePlus
User & Installation Guide

Version 1.3

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Table of Contents

Overview......................................................................................................................... 3

Chapter 1  Getting Started.............................................................................................. 4
  1.1 System Requirements............................................................................................... 4
  1.2 Download and Install the MultiMate Plus application ............................................ 4
     1.2.1 Where to find the MultiMate Plus software...................................................... 4
     1.2.2 How to install the MultiMate Plus software..................................................... 5

Chapter 2  User Interface Overview................................................................................. 6
  2.1 Main Menu Screen.................................................................................................... 6
     2.1.1 Navigating the Main Menu .............................................................................. 6
     2.1.2 Devices List/overview...................................................................................... 7
  2.2 Configuration Toolbar ............................................................................................. 8

Chapter 3  Create a New Device.................................................................................... 9
  3.1 Connect to a MultiLoad using Ethernet ................................................................. 9
  3.2 Connect to a MultiLoad using Line Controller (LC) ............................................. 10
  3.3 Create New Device without a Connection............................................................. 11
  3.4 Test connection...................................................................................................... 11

Chapter 4  Navigating and Editing Configuration....................................................... 12
  4.1 Configuration Options ............................................................................................ 12
  4.2 Navigating Configuration Menus .......................................................................... 13
     4.2.1 Editing Configurations .................................................................................... 15
     4.2.2 Network & Serial Comm Menu ..................................................................... 16
     4.2.3 Equipment Configuration Menu ..................................................................... 16
     4.2.4 Products Configuration Menu ....................................................................... 18
        4.2.4.1 Easily create base Components, Additives and Samplers ....................... 18
        4.2.4.2 Easily create Sealable Products ................................................................. 19
4.2.5 Alarms Configuration Menu ................................................................. 22

Chapter 5 MultiLoad Utilities ................................................................. 23

5.1 Importing Logos ..................................................................................... 23
5.2 Command Console .................................................................................. 24
5.3 Upload Firmware ..................................................................................... 26
5.4 BOL Editor .............................................................................................. 28
5.5 Custom Logic .......................................................................................... 30
  5.5.1 Getting started .................................................................................... 30
  5.5.2 Building a configuration ..................................................................... 31
  5.5.3 Continuing Configurations ................................................................. 33
  5.5.4 Saving / Exporting Custom Logic Configurations ............................ 34

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Overview

This document is designed to quickly guide the users of MultiLoad II products to the most common uses of MultiMate Plus, a MultiLoad configuration tool. This guide will help users to set up MultiMate Plus and familiarize them with navigating the menus for interaction with all Toptech’s MultiLoad II family of electronic load rack controllers.

The following table provides an information map to the material available in this guide.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Topics Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Getting Started</td>
<td>System requirements, Download and Installation Instructions.</td>
</tr>
<tr>
<td>2. User Interface Overview</td>
<td>Navigation of MultiMate Plus main menu and configuration toolbar.</td>
</tr>
<tr>
<td>3. Create a New Device</td>
<td>Setting up a MultiLoad connection using Ethernet, TMS Line Controller or Offline configuration.</td>
</tr>
<tr>
<td>5. MultiLoad Utilities</td>
<td>Overview of the Command Console, Firmware Upload, BOL Editor, Custom Logic and Import Logo features.</td>
</tr>
</tbody>
</table>

The following key makes it easier to find the information you need in this guide:

<table>
<thead>
<tr>
<th>ICON KEY</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![i]</td>
<td>Valuable Information</td>
</tr>
<tr>
<td>![icon]</td>
<td>Configuration</td>
</tr>
<tr>
<td>![connection]</td>
<td>Connection</td>
</tr>
</tbody>
</table>

Note that this guide covers MultiMate Plus functionality only. For information about base MultiLoad firmware please consult the MultiLoad II User Guide. For information about wiring please consult the MultiLoad II Installation Guide. For information about the MultiLoad register interface and Modbus communication, please reference the MultiLoad II Communication Guide. Updated versions of all manuals, including this one, are available on our website at [http://www.toptech.com](http://www.toptech.com).
Chapter 1 Getting Started

This chapter indicates the system requirements needed to run the MultiMate Plus application on your computer, and explains how to download and install it ready for use. Let’s get started!

1.1 System Requirements

- **OS:** Windows 7 or higher
- **RAM:** 390 MB or greater
- **System Software:** Microsoft .NET Framework 2.0 or higher

To obtain the latest version of the .NET Framework, visit http://www.microsoft.com/NET/ and follow the instructions for your specific system.

1.2 Download and Install the MultiMate Plus application

Before installing the latest version of MultiMate Plus - uninstall any version of MultiMate Plus prior to v1.2. MultiMate Plus does not support connectivity to MultiLoad firmware versions vX.31.07 and earlier.

1.2.1 Where to find the MultiMate Plus software

1.2.2 *How to install the MultiMate Plus software*

1. After downloading MultiMate Plus, open the .zip folder and run the setup.exe file by following the instructions of the Setup Wizard.

2. After the installation of the program, open MultiMate Plus from your Windows Start Menu. Windows Start Menu>Programs>Toptech Systems.
   You should also see a shortcut on your desktop to launch MultiMate Plus.

3. After installation of the program you will be able to start using the MultiMate Plus tool.
Chapter 2 User Interface Overview

This chapter provides an overview of what is available in MultiMate Plus, navigation of the Main menu and configuration toolbar.

2.1 Main Menu Screen

Opening MultiMate Plus, the main menu screen is the first screen to appear; from here you will be able to go to the different tools available in the application and get an immediate overview of all units previously connected or saved.

2.1.1 Navigating the Main Menu

Opening MultiMate Plus, the main menu screen is the first screen to appear. From here you will be able to navigate to the following menu options:

- Create a new device connection and see projects list, more info in Chapter 3
- MultiLoad configurations, more info in Chapter 4
- Use the Import Logo feature and edit your BOL with the BOL editor, more info in Chapter 5

![Main Menu Screen Diagram]
2.1.2 Devices List/overview

If it is not the first time you are using the MultiMate Plus application you will see that the main menu screen will also show you a full list of all MultiLoad devices with its configurations that you have already connected to or had setup in the past for easy access, consultation and/or modification.

Right clicking device reveals options to Edit Profile, Delete, Test Connection or Open.
2.2 Configuration Toolbar

When working on actual configuration there is a toolbar displayed in the right hand corner. Find out here what each of the icons on the toolbar do:

- **Save Status**
  - Changes have been saved.
  - Changes have not been saved.

- **Edit Connection Settings, Test Connection, Upload Firmware and access Command Console.**

- **Save changes status.**

- **Import Configuration File from Computer to MultiMate, or Download Configuration from MultiLoad into MultiMate.**

- **Upload Configuration from MultiMate to device, or Export Configuration from MultiMate to computer file.**

- **Save Configuration Changes.**
Chapter 3 Create a New Device

This chapter walks through the steps on how to create a new device/file in the application and how to setup a connection to a MultiLoad using 3 different ways: Ethernet communication, via a TMS Line Controller or an offline configuration setup.

Upon launching MultiMate Plus, you can configure the connection with the MultiLoad preset you wish to link up with and run a test.

3.1 Connect to a MultiLoad using Ethernet

This section provides a guideline to setup a connection to a MultiLoad using Ethernet communication.

1. Select Create New Device.
2. Enter the Name & corresponding IP Address of your new MultiLoad device.
3.2 Connect to a MultiLoad using Line Controller (LC)

Connecting to a MultiLoad device using the TMS Line Controller (LC) connection is outlined in the diagram below.

1. Select Create New Device.
2. Enter device Name, corresponding IP Address, Terminal ID and LC Name of your new MultiLoad device.
3.3 Create New Device without a Connection

Setting up a configuration, but without a predefined unit/connection is also possible. If you would like to edit a configuration, but not specifically linked to a certain MultiLoad you can go ahead and create a blank connection. This file can then be saved in the application and uploaded to MultiLoad devices at a later time.

1. Select Create New Device.
2. Enter device Name & leave IP Address blank.

3.4 Test connection

Verify the connection to your device by selecting Test Connection in your devices drop down menu. If your device fails to connect check your connection settings on MultiMate Plus and your MultiLoad.
Chapter 4 Navigating and Editing Configuration

Now you finished establishing a connection between MultiMate Plus and the MultiLoad, get ready to configure the unit! This section shows you how to navigate the configuration menus and how you can easily adjust and set the parameters on the MultiLoad using MultiMate Plus in 4 areas: Network & Serial Communication, Equipment, Products and Alarms.

More information on defining configuration parameters and how to set up your device can be found in the MultiLoad User Guide.

4.1 Configuration Options

After defining the connection settings to your device, select one of three configuration options from the New Device window before editing the configuration settings.

- Start configuration from factory defaults.
- Copy configuration from MultiLoad device to MultiMate.
- Start configuration from a saved .mlc file.

MultiMate Plus provides firmware prompts v.x.31.11 and newer, older prompts should be downloaded from your device.
When loading a new configuration onto an existing configuration the MultiMate Plus tool will highlight all the differences in parameters. By using the checkboxes, you can accept or reject individual changes in parameters before importing the new configuration.

4.2 Navigating Configuration Menus

MultiMate Plus provides easy navigation to change and review the following configuration menus: Network & Serial Communication, Equipment, Products and Alarms.
Configuration menus follow the same structure, a collapsible left menu bar for navigation and the detail parameter settings in the right window.
### 4.2.1 Editing Configurations

When modifying parameters MultiMate Plus uses a color code to highlight parameters with a different value than the default setting. Red means the value entered is outside the configurable range, yellow means the value is different than the default, and blue means the value is currently being edited.

![Preset #1](image.png)

- **Red = value enter is out of range**
- **Yellow = different than default setting**
- **Blue = value currently being edited**

ℹ️ The parameters in red text indicate a Weights & Measures protected parameter – just like in the MultiLoad itself.
4.2.2 **Network & Serial Comm Menu**

After establishing connection to a device the network and serial communication settings can be changed.

Setting up Network & Serial Comm configuration will update the configuration settings but will not change the current connection profile in MultiMate Plus.

4.2.3 **Equipment Configuration Menu**

In the equipment configuration screen, the left menu bar allows for easy navigation between presets and lower level equipment set ups. This menu bar be expanded or contracted by clicking the up or down arrows.
In the equipment configuration menu there are two parameter types, numerical values and drop down menus. Numerical value data types require a number within the allowable range of the MultiLoad. Drop down menus have an arrow to the right revealing the available parameter options. For simple navigation a MultiLoad symbol designates the default setting and pink text specifies the current parameter setting in drop down menus.
4.2.4 Products Configuration Menu

The product configuration menu allows for easy setup and navigation of base components, additives, samplers, and saleable products.

4.2.4.1 Easily create base Components, Additives and Samplers

Base components, additives and samplers can be easily created and authorized by using the top three windows in the configuration window.

See how to navigate the screen:
4.2.4.2  Easily create Sealable Products

The product wizard of the MultiMate Plus application simplifies setting up saleable products into five steps. Using the wizard you will be able to edit the product code, short description, long description, and product recipe.

Follow the 5 steps in the product setup wizard to have a finalized saleable product.

1  Define the Product code, Short and Long Description.
Select the base components, additives, and samplers that are a part of the saleable product. More than one of each can be selected; product recipe percentages can be adjusted in the final step of the product wizard.

After defining the components of the product recipe, edit the recipe percentages for each component and additive. Additional adjustments can be made in the product configuration menu.

Select Finish to finalize product setup.

Edit the recipes.
Additional changes can be made in the Saleable Products menu, including preset authorization and all features available in the product setup wizard.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Short Description</th>
<th>Long Description</th>
<th>Authorized Presets</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRD001</td>
<td>Prod 001</td>
<td>Default Product 01</td>
<td>Edit</td>
</tr>
<tr>
<td>Components</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAS001</td>
<td>70.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAS002</td>
<td>30.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delete</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRD002</td>
<td>Prod 002</td>
<td>Default Product 02</td>
<td>Edit</td>
</tr>
</tbody>
</table>

- **Configure product recipe percentages.**
- **Select to edit authorized presets for product.**
- **Select contributing components, additives and samplers.**
4.2.5 Alarms Configuration Menu

Use the alarms configuration menu to define alarm conditions and permissives at the various configuration levels. All alarm setup screens will indicate who has the authority to clear the alarm or how the alarm is to be cleared.

Configurable connection settings, alarm names and FCM output ports can be edited from the detailed screen.

Select which level alarm to configure.

Edit alarm names by selecting the pencil icon.

Select the ‘?’ icon to know more alarm information and what triggers it.

Setup FCM output address within alarm configuration.
Chapter 5 MultiLoad Utilities

MultiMate Plus utilities are additional features allowing user to more easily setup, customize and update their MultiLoad. These features include importing logos, editing and viewing a BOL, the command console and using the application to help with a firmware upgrade.

5.1 Importing Logos

Using the Import Logo feature users can easily display their logo on the MultiLoad home screen. This feature helps to position and upload the logo to the device.

1. Open compatible image (.jpeg .png).
2a. Easily adjust the size and position of the logo in the Original Image.
2b. Preview the final image in the Preview Image.
3. Use Save As... to save imported logo.
4. Upload image to selected devices.
MULTIMATE PLUS

Coloring and edits to the logo cannot be made within this tool.

After adjusting the logo size and position press upload and this dialogue box will appear. Select the MultiLoad devices to upload your logo and press accept.

---

5.2 Command Console

After opening a device connection, the command console allows users to read and update registers within the MultiLoad configuration. Selecting the name of your MultiLoad Device in the upper right corner will reveal a menu with the firmware version, connection profile, and command console, test connection and firmware upload feature.
After selecting the command console feature a dialogue box will appear. Typing R### will read a specific register, typing U### followed by a command will update that register with the new command.

Any changes made using the command console will update the MultiLoad configuration immediately.

More information on register locations is located in the MultiLoad Communications Manual.
5.3 Upload Firmware

The MultiMate Plus application allows users to update the firmware of their MultiLoad via Ethernet or Line Controller.

You can find this feature in the configuration menu of your device accessing it through the menu when clicking the device name.

After establishing a connection to the MultiLoad, the firmware version can be updated using the Upload Firmware tool. Open a firmware file (.bin) specific to your version of MultiLoad.
Uploading firmware might take some time. Be aware that uploading firmware using the MultiMate Plus over line controller is significantly slower than over Ethernet.

After the firmware finishes loading, a confirmation screen will appear. Verify the MultiLoad is not in use and you have saved your configuration before accepting. Accepting will initiate the upgrade process.


Navigate to Products>Hardware>MultiLoadII >Product Downloads. Select the latest version of MultiLoad Firmware and download the .bin file to your computer.

When upgrading firmware version older than v x.31.07 - if you experience any issue - contact Toptech Systems.
5.4 BOL Editor

The BOL Editor utility in the MultiMate Plus allows users to easily create a custom meter ticket and upload the template to your MultiLoad. After modifying the ticket users can also save the template to their computer and upload it to later to (other) MultiLoad devices. At the same the tool allows to download an existing template from a device to work on this one and open & use an existing BOL template from your computer.

The BOL Editor opens to the default MultiLoad meter ticket. Header components, detail components and total components can all be easily added, deleted and rearranged by dragging and dropping them on the BOL ticket area. The static text can be added by selecting the Text button on the screen and clicking in the BOL work area in the place where you want to add it. After dragging and dropping components and adding static text these fields can still be repositioned using the cursors of your keyboard.

The paper size of the BOL work area can be easily adjusted using the ‘Page button’ in the ribbon. For custom paper sizes you can resize the page by sliding the edges of the BOL work area. The actual size will be displayed as a number of rows and columns in the top right corner.

You can toggle the grid button to see a print preview of your ticket.
There is a maximum of 30 lines of static text available per meter ticket.
5.5 Custom Logic

The custom logic utility in MultiMate Plus provides a user friendly tool to build, edit, and comment custom logic configurations. Custom Logic made easy!

Select Custom Logic button to reach this utility.

Line number displays the registers storing custom logic values.

Function displays the custom logic functions used to build the logic.

Comments are entered by users and do not affect the logic.

5.5.1 Getting started

To open the Custom Logic utility from the Workspace screen click the ‘Custom Logic’ Utility. On the main page the first 15 lines of a blank custom logic configuration will be displayed.

There are two ways to begin a custom logic configuration:

1. Import a custom logic configuration from a device or file
2. Create a configuration from scratch in the tool
Comments entered in the custom logic utility will only be saved on firmware versions X.31.39 or greater.

### 5.5.2 Building a configuration

Whether opening an existing custom logic configuration or starting a new configuration, select the function field in the custom logic tool to begin. Use the mouse or arrow keys to navigate the group drop down menu to select a function.

*Typing the beginning of a function will autofill the field with relevant functions.*
Functions are characterized by the line number, equipment level assignment and input/output parameters. See an example of this below:

<table>
<thead>
<tr>
<th>Line Number</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>PRESET_WRITE_CFG(Low Flow Rate,2,[0004])</td>
</tr>
<tr>
<td>0001</td>
<td>PRESET_WRITE_CFG (parameter, preset_number, output_line)</td>
</tr>
</tbody>
</table>

Group=Write Configuration
Function=PRESET_WRITE_CFG
Input Parameters=Low Flow Rate, Preset Number
Output Parameter=Line Number [0004]
5.5.3 Continuing Configurations

The custom logic utility includes editing and comments that are not available on the MultiLoad devices.

- Function buttons allow for quick editing features.

<table>
<thead>
<tr>
<th>Line Number</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>PRESET_WRITE_CFG()</td>
</tr>
<tr>
<td>0001</td>
<td>PRESET_WRITE_CFG(parameter, preset_number, output_line)</td>
</tr>
<tr>
<td>0002</td>
<td>Number of Meters</td>
</tr>
<tr>
<td>0003</td>
<td>Number of Components</td>
</tr>
<tr>
<td>0004</td>
<td>Number of Additives</td>
</tr>
<tr>
<td>0005</td>
<td>Preset Enable</td>
</tr>
<tr>
<td>0006</td>
<td>Blending Type</td>
</tr>
<tr>
<td>0007</td>
<td>W&amp;M Controlled</td>
</tr>
<tr>
<td>0008</td>
<td>Proving Flow Rate</td>
</tr>
<tr>
<td>0009</td>
<td>Excess Flow Rate</td>
</tr>
<tr>
<td>0010</td>
<td>Overrun Alarm Vol</td>
</tr>
<tr>
<td>0011</td>
<td>Low Flow Start Vol</td>
</tr>
<tr>
<td>0012</td>
<td>Low Flow Restart Vol</td>
</tr>
<tr>
<td>0013</td>
<td>Low Flow Rate</td>
</tr>
<tr>
<td>0014</td>
<td>High Flow Rate</td>
</tr>
</tbody>
</table>

Select the ‘+’ to add 15 more lines, put to 1024 total lines.

Select the ‘?’ for more information on the group, function, inputs, available firmware version, description and examples.

Multiple lines can be selected at a time and the editing features can be controlled by shortcuts or right clicking with the mouse. The following hot key shortcuts below are available in the Custom Logic Utility:
### Hot-Key Function Description

<table>
<thead>
<tr>
<th>Hot-Key</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTRL+C</td>
<td>Copy</td>
<td>Copy the highlighted row(s).</td>
</tr>
<tr>
<td>CTRL+V</td>
<td>Paste</td>
<td>Paste copied row(s)</td>
</tr>
<tr>
<td>CTRL+A</td>
<td>Select All</td>
<td>Select all rows in the worksheet</td>
</tr>
<tr>
<td>CTRL+X</td>
<td>Cut</td>
<td>Cut the selected row(s)</td>
</tr>
<tr>
<td>CTRL+S</td>
<td>Save To File</td>
<td>Opens the file explorer to save custom logic configuration to a file</td>
</tr>
<tr>
<td>Delete</td>
<td>Delete Row(s)</td>
<td>Delete the highlighted rows</td>
</tr>
<tr>
<td>Backspace</td>
<td>Delete Row(s)</td>
<td>Delete the highlighted rows</td>
</tr>
<tr>
<td>Esc</td>
<td>Escape</td>
<td>De-selects any highlighted or copied rows</td>
</tr>
</tbody>
</table>

For more information on groups, functions and parameters consult the MultiLoad User’s Guide.

### 5.5.4 Saving / Exporting Custom Logic Configurations

After completing a custom logic configuration in MultiMate Plus you can export the configuration to:

1. A .mlc file
2. A device or multiple devices

When uploading the configuration to a device, a button to “Validate Configuration” will be available in the “Save Custom Logic To Device” dialog box.

Check configuration by selecting the “Validate Configuration” button.
Selecting “Validate Configuration” will check if there are any configuration warnings or errors. If issues are found with the configuration, a “View Issues” button will appear next to the device.

Any issues found will be displayed in the “Custom Logic Issues” dialog box after selecting the “View Issues” button above. Issues are displayed as either warnings (yellow symbol) or errors (red symbol).

A warning is typically displayed when a custom logic function in the custom logic tool is exported to a device where the custom logic function isn’t available in the device’s current firmware version.
An error is displayed when the custom logic line has been configured incorrectly. This can be due to configuring an incorrect function, parameter or selecting a firmware version from the “Select Firmware Version” dropdown box that is incompatible with the configured custom logic function.

The Custom Logic Utility will only read and write the 1024 custom logic registers. All other configuration parameters will be ignored.

Known conflicts between the MultiLoad and MutliMate Plus customer logic are listed below.

<table>
<thead>
<tr>
<th>Functions</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter_Reset_Totalizers</td>
<td>vX.31.17-19</td>
<td>The line reference parameter is not being saved correctly.</td>
</tr>
<tr>
<td>Component_Reset_Totalizers</td>
<td>vX.31.17-19</td>
<td>The line reference parameter is not being saved correctly.</td>
</tr>
<tr>
<td>Additive_Reset_Totalizers</td>
<td>vX.31.17-19</td>
<td>The line reference parameter is not being saved correctly.</td>
</tr>
<tr>
<td>Sampler_Reset_Totalizers</td>
<td>vX.31.17-19</td>
<td>The line reference parameter is not being saved correctly.</td>
</tr>
<tr>
<td>Email_Message</td>
<td>vX.31.37 – vX.31.39</td>
<td>MultiLoad does not import parameters correctly. The Email_Message parameter will be set to Email Msg 1 and the line reference will be set to [0000].</td>
</tr>
</tbody>
</table>