

OPERATOR'S MANUAL

M²+LBA Utility

Version 1.xx

Spiricon, Inc.
60 W 1000 N
Logan, Utah 84321

Phone 435-753-3729
Fax 435-753-5231

E-mail, Sales: sales@spiricon.com
E-mail, Service: service@spiricon.com

© Copyright 2005, Spiricon Inc., All rights reserved.

CHAPTER 1	Introduction	3
1.1	General Information.....	3
1.2	System Requirements	3
1.3	Installation.....	3
1.3.1	M ² -200 v4.15 and later.....	3
1.3.2	M ² -200 v3.61 to v4.11.....	4
CHAPTER 2	Operation	5
2.1	Initialization	5
2.2	Operation	5
2.2.1	Translation Table Control.....	6
2.2.2	ND Filter Wheel Control.....	6
2.3	Settings	7
2.3.1	Load... ..	8
2.3.2	Save... ..	9
2.3.3	Translation Table.....	9
2.3.3.1	Z Fixture.....	9
2.3.3.2	Z Lens	9
2.3.3.3	Z Camera	9
2.3.3.4	Steps / mm.....	9
2.3.4	Filter Wheel.....	9
2.3.4.1	Steps / Index	9
2.3.4.2	Home Offset.....	10
2.3.4.3	ND Filter Wheel.....	10

CHAPTER 1 Introduction

1.1 General Information

M²+LBA is a software program designed to allow you to control the M² Optical Train while collecting data with a LBA-PC or LBA-FW camera system. In order to use M²+LBA you must have both a M²-200 system and a LBA camera system.

1.2 System Requirements

A complete M²+LBA system consists of the following equipment:

1. The Spiricon M²+LBA software.
2. M²-200 v3.61 and later
 - a. M²-200 Optical Train
 - b. A STEP II motor controller and power supply.
 - c. NOTE: The M²-200 software must be installed before using M²+LBA.
3. LBA System
 - a. Either an LBA-PC system with an LBA-X00PC frame grabber and an appropriate camera.
 - b. Or a Spiricon LBA-FW product and associated camera.
4. A Pentium[®] style of compatible PC with:
 - a. A Pentium[®] or equivalent processor based motherboard.
 - b. Graphics accelerator card with support for a minimum 1024x768.
 - c. 256Mb main memory, 512Mb recommended.
 - d. 15Mb hard disk space available.
 - e. High-resolution color monitor.
 - f. Windows[®] 2000 with SP4 or Windows[®] XP Professional with SP2 or later.
 - g. A CD-ROM drive.
 - h. A compatible mouse and keyboard.

Pentium is a registered trademark of Intel Corporation.

Windows 2000 and Windows XP Pro are registered trademarks of Microsoft Corporation.

Note: *PC operating system, component and hardware manufacturers are constantly revising their products. Therefore Spiricon, Inc. makes no guarantee that any one brand or model of Personal Computer will be compatible with any or all of the features contained in this application, either now or in the future.*

1.3 Installation

1.3.1 M²-200 v4.15 and later

The M²+LBA software is installed as part of the M²-200 System beginning with M²-200 v4.15. No additional steps are necessary. To run M²+LBA click on the **Start** button, **Programs | Spiricon | M²-200 | M²+LBA Utility**.

1.3.2 M²-200 v3.61 to v4.11

The M²+LBA software was created after M²-200 v4.11. Customers with earlier versions will be sent a separate installation for the M²+LBA software in a ZIP file or on CD.

Note: *M²-200 must be installed before using M²+LBA.*

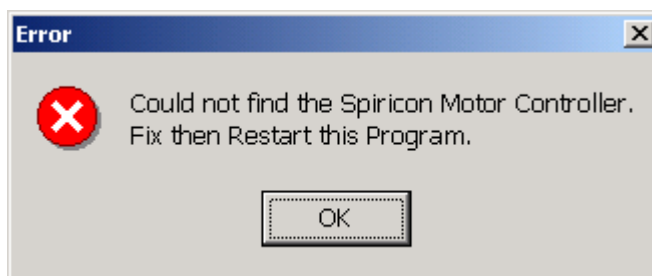
To install M²+LBA from a CD, using Windows Explorer go to the **M2+LBA** directory on the CD, double-click on the **Setup.exe** program, and follow the prompts. The M²+LBA software will be installed in the M²-200 installation directory and a link to the program will be inserted in the **Start Menu | Programs | Spiricon | M²-200**. To run M²+LBA click on the **Start** button, **Programs | Spiricon | M²-200 | M²+LBA Utility**.

To install M²+LBA from a ZIP file, unzip the file to a temporary directory - be sure the "Use folder names" option is checked in order to place the files in the directories specified in the ZIP file. Using Windows Explorer, go to the **M2+LBA** directory in the temporary directory, double-click on the **Setup.exe** program, and follow the prompts. The M²+LBA software will be installed in the M²-200 installation directory and a link to the program will be inserted in the **Start Menu | Programs | Spiricon | M²-200**. To run M²+LBA click on the **Start** button, **Programs | Spiricon | M²-200 | M²+LBA Utility**.

CHAPTER 2 Operation

2.1 Initialization

When the M²+LBA software is started it tries to find and connect to the USB motor controller. If the motor controller cannot be found, the software displays an error message and terminates.

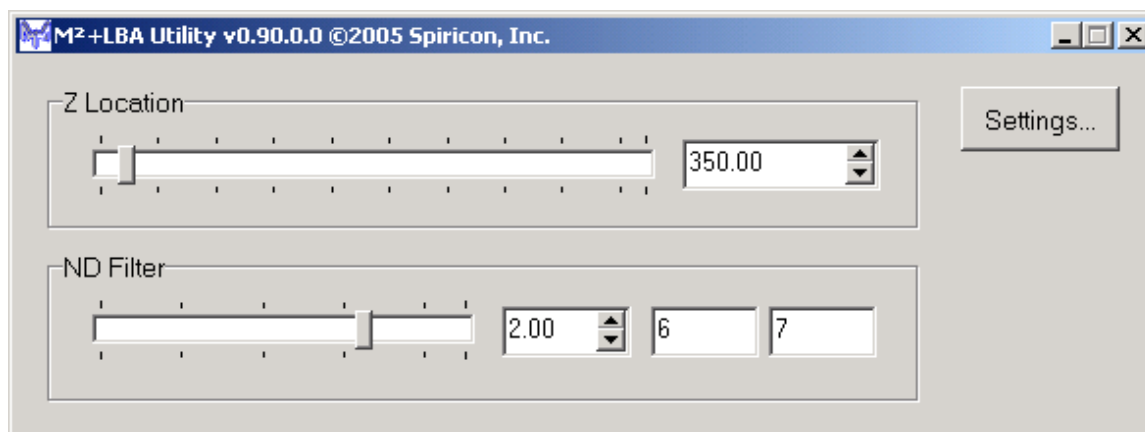


If the motor controller is not found make sure the USB motor controller is powered on, the USB cable is connected to the computer, and cables are connected and secured to the optical train.

The software must also find and read the current settings file. This could be the current M²-200 CFG file or the current M²+LBA settings file. If the file is not found, the software displays an error message and then allows you to select a settings file. Each optical train has its own unique settings file. Be sure you select the settings file associated with the M²optical train you are using. If you have any problems, use the file from your M²-200 installation CD with a file name of the form ~<serial_number-fl-wavelength>.cfg. See the M² Setup section of your M²-200 Operator's manual for more information.

If the USB motor controller is found, the software initializes the table to known positions. The software first homes the filter wheel then changes the wheel to the last filter setting. Every time the filter is changed it is remembered and will be restored the next time the software is started. The software then homes the translation table and moves the table to the last position. As with the filter, the last table position is remembered and the table is restored to that position the next time the software is started.

2.2 Operation



2.2.1 Translation Table Control

The translation table controls the distance the beam will travel from the lens to the camera. With the proper setup, you should be able to see the beam well before, through, and well after the artificial waist created by the lens.

You can move the translation table in three ways:

- The Z Location slide control represents the scope of travel allowed by the translation table. Move the mouse pointer on top of the Z Location slide bar, click and hold the left mouse button, then move the slide bar to the desired location. The edit control to the right is updated to indicate the position where the table will move. The table will start to move when you release the mouse button.
- Type a location into the Z Location edit control and hit the Enter key. The table will start to move when you hit Enter.
- Or, click on the edit spin control. One click changes the value by 50. Click and hold changes the value continuously by 50 until you release the mouse button or the limit is reached. The table will start to move when you release the mouse button.

The mouse pointer will change to a pointer with an hourglass, and the edit control will be disabled, while the table is moving. Click once on the slide bar to stop the table movement. The mouse pointer will change back to just an arrow, and the edit control will be enabled, when the table is stopped or reaches the specified location.

2.2.2 ND Filter Wheel Control

The ND Filter Wheel controls the amount of attenuation in the beam path. The ND Filter Wheel is positioned in the beam path just before the camera.

You can control the ND Filter Wheel in three ways:

- The ND Filter slide control represents all of the ND filter combinations between blocking the beam and no attenuation. To increase attenuation or block the beam, slide the control bar to the left. To reduce or remove attenuation, slide the control bar to the right. The edit control to the right is updated to indicate the ND filter combination that will be rotated into the beam path – a value of 100 is used to indicate the beam is blocked. The filter wheels will start to move when you release the mouse button.
- Type a filter value into the ND Filter edit control and hit the Enter key. The filter wheels will start to move when you hit Enter.
- Or, click on the edit spin control. One click changes the value by 0.10. Click and hold changes the value continuously by 0.10 until you release the mouse button or the limit is reached. The filter wheels will start to move when you release the mouse button.

The mouse pointer will change to a pointer with an hourglass, and the edit control will be disabled, while the filter wheels are moving. The mouse pointer will change back to just an arrow, and the edit control will be enabled, when the filter wheels reach the specified position.

The other two controls indicate the logical position of the driven wheel A, and the following wheel B.

2.3 Settings

Click the **Settings...** button to display the Settings dialog. The Settings dialog contains the calibration and configuration information about your specific M² optical train.

You can change most of the values in this dialog. Be very sure that any changes you make exactly match the physical setup of your M² optical train.

Settings

Translation Table

Z Fixture (mm) 1200.0

Z Lens (mm) 25.0

Z Camera (mm) 25.0

Steps / mm 50

Filter Wheel

Steps / Index 25

Home Offset 5

	Wheel A	Wheel B
Slot 0	100.00	0.00
Slot 1	0.00	4.30
Slot 2	0.00	4.00
Slot 3	0.15	3.30
Slot 4	0.30	3.00
Slot 5	0.50	2.30
Slot 6	0.70	2.00
Slot 7	1.00	1.30

OK Cancel Load... Save...

2.3.1 Load...

Click the **Load...** button to load table settings from a different settings file. You can load table settings from an M²-200 CFG file or a previously saved M²+LBA settings file.

The selected settings file will become the default settings file and will automatically be loaded the next time you start M²+LBA.

The filter wheel and table may have to be reinitialized after you click OK after you load a new settings file.

2.3.2 Save...

Click the **Save...** button to save the table settings to a file. You can save the table settings to an M^2 -200 CFG file or a M^2 +LBA settings file. Only the table settings are written to the M^2 -200 CFG file, no other M^2 -200 configuration values are changed. This CFG file can then loaded into M^2 -200. If you save to a M^2 +LBA settings file it cannot be loaded into M^2 -200 because it is missing all the other M^2 -200 configuration values.

The selected settings file will become the default settings file and will automatically be loaded the next time you start M^2 +LBA.

2.3.3 Translation Table

2.3.3.1 Z Fixture

This is the distance that the beam travels from the M^2 optical train faceplate at the lens opening to the M^2 optical train faceplate at the camera opening.

This value typically will never need to be changed.

2.3.3.2 Z Lens

This is the distance from the middle of the lens to the M^2 optical train faceplate.

This value will need to be changed if you insert an extension tube between the M^2 optical train faceplate and the lens.

2.3.3.3 Z Camera

This is the distance the M^2 optical train faceplate to the camera imager.

This value may need to be changed if you change cameras.

2.3.3.4 Steps / mm

The number of motor steps per mm of travel for the mirror translation system.

This value cannot be changed.

2.3.4 Filter Wheel

2.3.4.1 Steps / Index

The number of motor steps between ND filter index positions.

This value cannot be changed.

2.3.4.2 Home Offset

The number of motor steps from the filter wheel home position to centering the filter over the camera opening.

This value typically will never need to be changed.

2.3.4.3 ND Filter Wheel

This list contains a catalog of the ND filter values for each of the two A and B filter wheels. The Position is the index location for each filter.

In a standard system, the ND values shown are nominal values for a HeNe laser at 632nm wavelength. These values are reasonably accurate over the visible spectrum, and less so into the UV and NIR regions.

These values will need to be changed if you change the filters in either wheel. Be sure you enter the correct value for each filter or the M²-200 software may produce bad results or become inoperable.