

VMU300A
Video Caliper

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UNPACKING

The VMU300A and VMU400A systems include the following components:

- VMU300A or VMU400A Video Caliper Unit
- 12 volt universal desktop power supply
- This operation manual

Please inspect all items carefully and report any damaged or missing items to your dealer or Microlmage Video Systems as soon as possible. Do not power up any damaged unit.

CONNECTIONS

Power Supply

The VMU300A and VMU400A Video Calipers ship with a standard 12VDC desktop power supply that is compatible with 120V or 230V power. Older units (those before June 2004) included a wall plug, 120V only power supply standard.

A power cord suitable for use in North America is included. The power supply has a standard IEC (computer style) connector that allows the factory supplied cord to be easily replaced with one for the proper country. Microlmage Video Systems does not supply power cords for countries other than the North America.

Connect the power supply to the power input on the VMU unit. Also, connect the power supply to a suitable power receptacle/outlet which meets the appropriate ratings on the power supply.

All VMU300A and VMU400A units may be optionally powered from an external +12VDC (+10 to +20V), negative ground power source which is relatively clean. Contact Microlmage Video Systems for additional information.

Video Input

A video source must be connected to the VMU300A or VMU400A for it to function properly. Units produced after June 2004 support both NTSC and PAL (CCIR and RS170) video. They will automatically detect the input signal and adjust accordingly. It takes less than one second for a valid signal to be detected and the VMU to set itself accordingly.

The VMU300A may be connected to either an S-Video camera (via the S-Video 4 pin input connector) or to a composite or B&W video source (via the Video input BNC connector). When used with a B&W video source, the VMU300A/VMU400A, the user should set the unit to B&W mode - see B&W or Color Mode in the MENU section of this manual.

The VMU400A may be connected to an RGB or RGB and Sync video source (via the 9 pin D-sub RGB IN connector). Microlmage Video Systems has suitable cables available for connection to other devices. The pin connections on the 9 pin D-sub follow the industry standard for an RGBS signal.

Video Output

The video output must be of the same type as the video input signal, i.e. if S-Video is used as the input, S-Video **MUST** be used as the output. This unit will not transpose between different signal types. To use the external sync output of the VMU400A, external sync must be connected to the input of the unit, it will not generate external sync by itself.

Connect a suitable output cable from the appropriate video out connector to a monitor or other display device. Make sure that the monitor (or other device) is correctly set to view that type of video signal.

Other Connections

If you have a custom option installed which requires an external connection, please see the supplement to this user guide for additional information.

CONTROLS & INDICATORS

Power Switch

The power switch is located in the lower right corner of the front panel. Pressing it once turns the unit on, pressing it again turns the unit off. When off, the unit draws minimal power. All VMU units will remember their settings when the power is turned off. More information is provided later in this text.

Position Control 1

This rotary control will move the left or top cursor (depending on the setting of the X/Y switch) or it will move both (same axis) cursors together if the track function is enabled.

Position Control 2

This rotary control will move the right or bottom cursor (depending on the setting of the X/Y switch). If track mode is on, it will adjust the spread between the two (same axis) lines.

Lock Switch 1 and Lock Switch 2

Enabling the lock function will cause the related rotary position control to have no effect while lock is on (indicated by the RED lamp below the switch). Lock functions are remembered independently for the X and Y axes. A Lock override can be set in the menu system to lock a

control regardless of the switch setting (which will also be indicated by the light).

Track

Enabling the tracking function (lamp on) will cause the left position control to move both lines of the same axis together (keeping the spacing constant). The right control will adjust the spacing between the lines. When the tracking function is disabled (indicator extinguished), the two controls will move the lines fully independently.

Position

The position set function allows the user to relocate the numeric display. Pressing the POSITION switch will turn on (indicator blinking) the position set function for the numeric dimension display. When the position function is enabled, turn the left (#1) rotary control to move the horizontal position and the right (#2) rotary control to change the vertical position. Press the POSITION switch again when finished to disable the position set function. Note that many other functions are disabled while position set is on.

Note: The operation of the above function has changed from the previous version # 1.2

Display

Pressing the DISPLAY switch will toggle the overlay on and off including the character and line display. This makes it easy to go to a “clean source image” and back to the measurement mode. When the display is off, many switches and the controls are inactive to prevent accidental changes. The indicator is illuminated when the display is on. The Display Switch will cycle through three different states: 1) overlay completely off, 2) Only lines displayed, the numeric (coordinate) display is off, and 3) both lines and the numeric (coordinate) display are enabled.

Note: The operation of the above function has changed significantly from the previous version # 1.2

X/Y

The X/Y switch chooses between X or Y axis movement. There is an indicator for each direction. Note that the positions and lock information are remembered independently for each axis.

B/W

Selects whether the lines are displayed as black or white. This switch does not affect the color of the numeric display or menu system.

Menu

Pressing the MENU switch places the unit in the menu mode allowing the user to set his or her preferences. The exact menus are covered in a later chapter in this manual.

If the password protection is turned on, you may have to enter a password before using this function.

Note: The operation of the above function has changed from the previous version # 1.2

Set

Pressing SET will allow the user to calibrate the unit and also set the unit of measure. Operation is through simple menus.

If the password protection is turned on, you may have to enter a password before using this function.

Note: The operation of the above function has changed from the previous version # 1.2

← (backspace)

Pressing the backspace button will allow you to edit the numeric calibration or the password as it is being entered. Backspace deletes the character last entered.

0 thru 9 and . (decimal point)

These keys are used to enter the calibration reference, enter the password and to navigate the menu systems. They are used in a way similar to a calculator. Note also that the 2, 4, 6 and 8 keys are also used as a four directional cursor array when changing the custom unit of measure settings.

Enter

Completes the entry of a calibration setting, password or completes a menu operation.

Store

Pressing the STORE key will blink the indicator next to it and display a message on the screen asking you to press a number key. After pressing the STORE key, you must press one of the number keys (0 through 9) to specify which memory, which will extinguish the indicator. You can also cancel the storage by pressing STORE a second time (which will also extinguish the indicator). Each memory will save most of the settings of the unit, allowing easy access to multiple calibrations. See the section on Memories later in this manual.

If the password protection is turned on, you may have to enter a password before using this function.

Note: The operation of the above function has changed from the previous version # 1.2

Recall

Pressing the RECALL key will blink the indicator next to it and display a message on the screen asking you to press a number key. After pressing the RECALL key, you must press one of the number keys (0 through 9) to specify which memory location you choose, which will extinguish the indicator. You can also cancel the recall by pressing RECALL a second time (which will also

extinguish the indicator). See the section on Memories later in this manual.

Note: The operation of the above function has changed from the previous version # 1.2



Overview

Main Menu

1. Line Options
2. Coordinate Options
3. B/W or Color mode
4. Color Bars
5. Remote Options
6. System Options
7. Password Options

0. Exit

Press number for selection

The VMU series of Video Calipers are designed for ease of use. Commonly used functions are easily changed with front panel switches while less used functions can be changed only with the menus. This section will describe the various menus and how they work. For the calibration set menus and units of measure, please see the next section.

If you have the Password Protection enabled, you may need to enter a password before you can enter the menu. See the section on Password Protection for additional information.

The menus system is divided into a hierarchy, or tree structure. Each branch has several related menus that can be changed. The main or top menu is the first one you see after pressing the MENU button. You then choose one of the categories and press the number key relating to that menu. This will bring up another menu where you press the numeric key of choice and so on. Enter will select the highlighted item. Pressing the 0 (zero) key will exit each menu back up to the previous menu.

Main Menu

Each menu will be described below:

Line Options

1. X1 Line Options This item selects whether the X1 (left) line is set to solid, serrated or turned off. Each line may be set individually.

2. X2 Line Options This item selects whether the X2 (right) line is set to solid, serrated or turned off. Each line may be set individually.

- 3. Y1 Line Options This item selects whether the Y1 (top) line is set to solid, serrated or turned off. Each line may be set individually.
- 4. Y2 Line Options This item selects whether the Y2 (bottom) line is set to solid, serrated or turned off. Each line may be set individually.
- 5 Lock Overrides Allows you to enable lock overrides for each line. If these are set to on, the line will remain locked regardless of how the front panel lock switch is set (lock indicators will light).
- 6 Box/Lines This will set whether lines or a box will be displayed. The lines are full screen length. Boxes may be set as either an outline (normal box mode) or solid (filled).
- 7 Line Size Line size can be set to thin or thick. X and Y axes may be set individually. When the line size is set to thick, measuring resolution will be lower due to video system restrictions and display capabilities. Thin lines may also cause a slight increase in apparent flicker on some monitors due to limitations of the NTSC/PAL video system.

Coordinate Options

- 1. Display Options You can choose whether to display the numeric value for X, Y or diagonal measurements. Any combination can be displayed.
- 2. Character Color Sets the foreground (character) color of the alpha-numeric digits but does not affect the line color (see the B/W switch to change the line color). Eight color settings are possible. In B&W mode (and most PAL modes), the colors are displayed as shades of gray.
- 3. Background Color Sets the background color of the alpha-numeric digits but does not affect the line color (see the B/W switch to change the line color). Eight color settings are possible in addition to no background. No background allows the characters to display directly on the video image without any solid area behind them. In B&W mode (and most PAL modes), the colors are displayed as shades of gray.
- 4. Display Layout Chooses whether the X, Y and diagonal dimensions are displayed in a row or column format.
- 5. Precision Digits Allows the user to choose the precision of the measurement display. For readability, the display precision can be reduced to only the amount of information that is really needed for the application. The precision can be set from 2 to 5 digits, with 4 being the factory default.

B/W or Color Mode

The user can select whether the Video Caliper is used with Black and White (B&W) or color

video. For the unit to display the images properly, it must be set for the proper mode. If the unit is set to color mode on a B&W signal, there may be extra grain present in the picture, especially around the characters. If the unit is set for B&W when used with a color system, it will display only B&W characters and color bars will be B&W too. When the unit is used with PAL composite/S-video or B&W video, it automatically is switched into B&W mode. Only RGB will display color overlay data in PAL mode.

Color Bar Menu

A reference color bar generator is built into the Video Caliper and can be enabled through this menu. When color bars are turned on, the camera or other input video image will not be visible. The color bars are designed to test for the presence of the colors and system troubleshooting. The color bars are not designed to replace a precision test signal generator for calibration purposes.

Remote Options

The remote options are only used when the factory optional remote interface is ordered and installed in the unit. This interface comes with a separate interface operation manual.

System Options

1. System Properties This menu shows the product name, the firmware revision and code base as well as the Microlmage copyright for the code. There is also a link to the Microlmage Web site as well.

Password Options

Note: The Password Protection System was added to version 2.00 in late September, 2006

1. Password Mode There are five (5) different modes of operation for the password system. They are as follows:
 1. Disabled - This will allow all menus and the store function to be accessed without having to enter a password. This is the same as the previous versions 1.2 and earlier which lacked the password protection capability.
 2. Enable at Power Off - Once the correct password is entered, all functions will be accessible without having to re-enter the password until the power is turned off to the unit, which will place it back in protected mode, requiring the password to be entered to access the menus and store function.
 3. Enable at Menu Exit - Each time a menu is exited, the password protection will be re-enabled so the next time menu, set

or store buttons are pressed, the password will have to be entered again.

4. Menu Exit + 1 min - Approximately one minute (1.2 minutes for PAL) after exiting a menu, the password requirement will automatically become active, requiring you to enter the password again the next time Menu, Set or Store are pressed. The time is counted from the last time a menu is used. If you used the menu every 45 seconds, the password would never be required. This mode is the factory default.

5 Menu Exit + 5 min - Approximately five minutes (6 minutes for PAL) after exiting a menu, the password requirement will automatically become active, requiring you to enter the password again the next time Menu, Set or Store are pressed. The time is counted from the last time a menu is used. If you used the menu every 4 minutes, the password would never be required.

2. Protect Now This immediately reinstates the password requirement and would be the same as turning the unit off and back on. Use this when you make changes and need to have the unit password protected before leaving the location.

3. Change Password Allows you to change the password to any number up to 8 digits. You need to enter the number, press Enter, then enter the number again. The backspace key can be used to correct entry. Passwords do not have to be all eight digits, use the number of digits you feel necessary to secure the unit. In fact, if no number is entered in either box, then that becomes the password, just pressing enter will get you past the password screen but that is not recommended for security. Both entry boxes must match to complete the function. If they do not, a screen will inform you that they don't match and ask you to press the Enter key to try again. There is no cancel function, turn the unit off to cancel this command. When both input numbers match, a screen will be display that indicates the password has been changed and asks you to press the Enter key to continue.

Note: It is recommended that the password be changed from the default password the unit is shipped with since that password is in the manuals and on the internet.

WARNING: DO NOT FORGET YOUR CHANGED PASSWORD!

Scale and Unit Parameters

- 1 Set Scale Using X Axis
- 2 Set Scale Using Y Axis
- 3 Clear Scale
- 4 Select Unit
- 5 Define Custom Unit

0 Exit

Press number for selection.

Overview

The SET menu is similar in operation to the MAIN MENU, however the SET menu is used to set the calibration for the unit and the unit of measure. See the section about operation (setting the scale) for additional information on using the SET menu. Below, each menu is described in detail. Calibration only needs to be set for one axis to calibrate all directions.

If you have the Password System enabled, you may need to enter a password before you can enter the set menu. See the section on Password Protection for additional information.

Set Scale Using X Axis

This will set the calibration using the horizontal (left to right) axis, or the distance between two vertical (up-down) lines. It will accept any number, up to four digits between 0.0001 and 9999 for the calibration.

Note that measuring is much more precise when setting the calibration on the X axis, as opposed to the Y axis. Calibration is also more precise when the distance between the two lines is as wide as possible during calibration.

Set Scale Using Y Axis

This will set the calibration Using the vertical (top to bottom) axis, or the distance between two horizontal (left-right) lines. Enter any number, up to four digits between 0.0001 and 9999 for the calibration.

Note that measuring is much more precise when setting the calibration on the X axis. Y axis calibration is provided for those places where X axis calibration is impractical. Calibration is also

more precise when the distance between the two lines is as wide as possible during calibration.

Clear Scale

Clear scale will set the calibration to a value of 1.0000 per pixel regardless of the line positions. This can be handy for making absolute position measurements with the lines and measuring in pixels.

Select Unit

You will initially be provided with three categories as follows:

1. Metric Units A selection of commonly used Metric units are available in this menu. Press the number corresponding to the unit to be displayed.
2. English Units A selection of commonly used English units are available in this menu. Press the number corresponding to the unit to be displayed.
3. User Defined This will display all the user defined units. Units must have been previously defined (see menu item 5, Define User Unit below).

The unit of measure is the same for all three axes.

Define User Unit

Up to eight different user defined units can be entered. Each can be one or two characters long. Once defined here, they will be available in the Select Unit menu described above. To set a unit, press the appropriate number for the location where you want to save the unit. Next, press the up and down keys (#2 and #8) to change the character. Use the left and right keys (#4 and #6) to select between the left and right characters. Press the ENTER key when complete.



Overview

The VMU300A and VMU400A incorporate ten user accessible memories which save most system settings. This allows you to save calibration settings for different zoom factors. The unit will retain the information in memory after power is removed for up to several years.

Memory Store

At any time during normal operation, you can save the current calibration and cursor positions into one of the ten memories. To save a setting into memory, press the save button (the red indicator next to it should illuminate). Next press a number from 0 through 9 which corresponds to the memory location you want to save to. To cancel a save, before pressing the number, press the save button a second time or press the enter button.

If you have the Password System enabled, you may need to enter a password before you can enter the store function. See the section on Password Protection for additional information.

Note: It may take up to 5 seconds after the save button is pressed for the setting to be stored into the non-volatile (long term) memory. This is due to the multi-tasking nature of the unit's operating system. Do not turn the unit off or remove power until at least five seconds after pressing the number key of the save operation.

Note: The operation of the above function has changed from the previous version # 1.2

Memory Recall

At any time, you can recall one of the ten memories. To recall one of the settings, press the recall key and then press one of the number keys that corresponds to the desired memory.

Note: The operation of the above function has changed from the previous version # 1.2

PASSWORD
PROTECTION

Overview

The VMU300A & VMU400A version 2.0 and higher incorporate a password protection system to disallow entry to the menus as well as the set and store functions. This is to help protect against accidental or intention corruption of settings in a production or unsupervised environment.

To be secure, the password should be changed before the unit is deployed. Use main menu item 7 to set a new password and change the mode. Write down and secure your new password where you will be able to find it. If your password is lost, you may have to send the unit back to MicroImage Video Systems to have the password reset.

The factory default password is: 123
The default mode is: Menu Exit + 1 min

Note: Performing a factory defaults reset will not change the password or password mode.

OPERATION

Overview

This section will describe the basic use of the Video Caliper. The unit should be properly connected and operating. Make sure that the cursors and dimensions are displayed before continuing.

Calibration

In order to use the caliper, it must first be calibrated. Place an object with a known dimension (the reference object) in the field of view, at the same distance from the optics (lens) as the object(s) you wish to measure. It is best to set the reference dimension using the X axis as this provides better accuracy. X axis measurements provide better resolution as well. This is due to the lower vertical resolution video (480 NTSC / 576 PAL). The horizontal (x axis) resolution is less restrictive since it does not have a hard resolution limit.

Once the reference object is fully visible in the monitor, move the cursors to a known dimension on the object. Using a reference dimension that is one half the screen width or more will result in the best measurement accuracy.

Setting the Scale

Press the SET button to bring up the SCALE and UNIT PARAMETERS menu.
Press 1 to set the scale using the X axis or press 2 to set the scale using the Y axis.
Enter the dimension of the reference object that is between the cursors.
The value entered must be in the range of 0.0001 to 9999.
You can use the Backspace (←) key to delete an incorrectly entered digit.
Press the Enter Key when done.

When the reference dimension is entered as above, you can remove the reference object and measure any item at that distance from the optics (lens) in either the X, Y or diagonal directions.

Adding a unit of measure

You may also wish to add a unit of measure to your dimension display. The following procedure is used to add a unit of measure to the dimension display:

Press the SET button to bring up the SCALE and UNIT PARAMETERS menu.
Press 4 to access the SELECT UNIT menu.
Press 1 to use a metric unit, 2 to use a US unit or 3 to use a custom unit. If you need to set a custom unit first, press 4 and follow the procedure in the section describing custom units.
Next press number 1 through 8 to choose the appropriate unit of measure.
Press 0 twice to exit (once to return to the Scale and Unit Parameters Menu and the second time to exit the menus).

Saving the current configuration

Once you set a calibration, you may want to store it in memory for use later, so you don't have to keep re-calibrating for the same zoom or magnification factor. You can save the data in one of ten memories by doing the following:

Memory Store

Set the cursors and scale for your application

Press the STORE key (the indicator should blink and a screen will ask you to enter a number)

Press a number (0 through 9) to select one of the ten memory locations (indicator should extinguish after pressing the number)

Within five seconds the state of the machine will be saved to that memory number which will be retained after power off.

Note: If power is turned off immediately after pressing the memory location, the data may not be saved or may be corrupted. It takes up to five seconds to write the data to memory.

Note: If you have the Password Protection enabled, you may have to enter a password to use the Memory Store function.

Note: The operation of the above function has changed from the previous version # 1.2

Memory Recall

To recall from memory, press the RECALL key (which will cause the indicator next to it to blink and a screen will display indicating you should press a numeric key. Next, press a number key (0 thru 9) relating to the memory you wish to recall from. There are ten memories 0 through 9. The indicator should stop blinking after pressing the numeric key.

Note: The operation of the above function has changed from the previous version # 1.2



FACTORY
DEFAULTS

Overview

The VMU300A and VMU400A can be returned to factory defaults at any time. Use the following procedure to reset the unit:

1. Turn the unit off
2. Depress the backspace key and hold it while turning the power on. Keep pressing the backspace key for at least 3 seconds or until after you see the lines and coordinate (numeric) display come on.

The unit will now be reset and ready for use.

Note: All user settings except the password settings will be lost, this includes the 10 user memories.

Note that the reset WILL NOT reset the password or the password mode. If you have lost your password, please contact Technical Support at MicroImage Video Systems for solutions.

Note: The operation of the above function has changed from the previous version # 1.2

Specifications

Calibration Entry range	0.0001 to 9999
Numeric Display Range	0.00001 to 15668400
Significant Digits	Selectable 2, 3, 4, 5, or 6
Password Size	0 to 8 digits, may also be disabled as a user selectable option.
Scale Display Layout	Row or Column
Calibration Axes	Can be calibrated on X or Y axis
Measurement Axes	Any combination of X, Y and Diagonal measurements
Scale Display Position	Movable anywhere within 90% center of screen
B&W Select	Menu setting to remove chroma (color) to support B&W video
Line Attributes	Individually selectable as off, solid or serrated
Rule Mode	Full line or box display
User Defined Memories	10
User definable units of measure	8 (2 digits each)
Color Bars	Color will not be displayed in Black & White, PAL composite or PAL S-Video modes
Display colors	
Foreground	(8) Black, Blue, Red, Magenta, Green, Cyan, Yellow, White Note: 8 shades of gray for B&W video & PAL comp/S-Video
Background	(9) Black, Blue, Red, Magenta, Green, Cyan, Yellow, White and Transparent; Note: 8 shades of gray for B&W video & PAL comp/S-Video
Character Cell Display	16x20 pixel cell, interlaced (HxV)
Non-Volatile Memory type	EEPROM
System Microprocessor	16/32 bit architecture
Line Generation	Digitally generated by Microlmage Video Systems custom circuit
Display controller	Custom Microlmage Video Systems integrated display controller
Front panel controls	(2) Line position controls, multi-turn precision optical encoders
Front panel switches	(25 total) Power, Lock 1, Lock 2, Track, Scale Position, Scale Set, Display On/Off, B/W, X/Y, Menu, Store, Recall, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, Decimal Point (.), Backspace, Enter
Front Panel Indicators	(10) Power, Lock 1 on, Lock 2 on, Track on, Scale Position on, Display on, X, Y, Store, Recall
X axis line width	NTSC - 40.75nS (Narrow), 81.5nS (Wide) PAL - 33.9nS (Narrow), 67.8nS (Wide)
Y axis line width	1 scan line (Narrow), 2 scan lines (Wide)
Line Resolution	NTSC - 1280 x 480 (Frame/Narrow), 1280 x 240 (Field/Wide) PAL - 1536 x 576 (Frame/Narrow), 1536 x 288 (Field/Wide)
Adjustment range	98% of normal visible raster area minimum
Sync system	RS170A or CCIR
Color System	NTSC or PAL
Genlock	Precision Phase Locked Loop (PLL), square pixel
Bandwidth	Greater than 30 MHz
Input Levels	
Composite	1.0Vpp composite, 75 ohm
S-Video	1.0Vpp (Y), 0.286Vpp burst (C), 75 ohm
RGB	0.7Vpp non-comp / 1.0VPP Comp, 75 ohm
Sync	0.3-4.0Vpp, 75 ohm

Output Levels	
Composite	Same as respective input, +/-5% into 75 Ohm
S-Video	Same as respective input, +/-5% into 75 Ohm
RGB	Same as respective input, +/-5% into 75 Ohm
Sync	Same as input level, up to 2Vpp. +/- 5%, into 75 Ohm
Connectors	
Composite	BNC Female
RGB & Sync	9 pin D-sub Female
S-Video	4 pin mini-DIN Female (std. S-Video connector)
RS232	8 pin mini-DIN Female
Power	2 pin 2.1mm Coaxial Power Connector Female
Remote port (optional-consult factory)	
Data format	EIA-232 (RS-232)
Language	MicrolImage Control Language
Baud Rate	300, 600, 1200, 2400, 4800, 9600, 19200
Data Bits	7 or 8, selectable
Parity	Off or Even, selectable
Stop Bits	1
Temperature	
Operating	0 deg ~ 40 deg C (32 deg - 104 deg F)
Storage	-40 deg ~ 60 deg C (-40 deg - 140 deg F)
Humidity	
Operating	10% ~ 90% (non-condensing)
Storage	5% ~ 95% (non-condensing)
Power	(120-230VAC Universal Power adapter included)
Voltage	12VDC (+9 to +20 VDC)
Consumption	Approximately 270mA typical at +12VDC
Size	9.00" (W) x 7.63" (D) x 2.88" (H) 229 mm (W) x 194 mm (D) x 73 mm (H)
Weight	1 lbs. 14 oz., (851g)
Country of Origin	Manufactured in the USA by MicrolImage Video Systems

Specifications are subject to change without notice.

Warranty

Microlmage Video Systems warrants that each VMU300A/VMU400A unit is free from defects due to faulty materials or improper workmanship for a period of one (1) year. Microlmage Video Systems further warrants that any part which proves defective in materials or workmanship within one (1) year, will be replaced or repaired at no cost to the user. Labor to replace defective parts will be done without charge, provided the equipment is returned to Microlmage Video Systems prepaid, insured and properly packaged. Prior return authorization must be obtained from Microlmage Video Systems.

NOTE

This warranty covers the VMU300A/VMU400A only.

CONDITIONS

This warranty is void if the warranted part has been altered or subjected to abuse or misuse. Defective parts must be returned to Microlmage Video Systems

SOLE WARRANTY

This Warranty is in lieu of all other warranties expressed or implied including, without limitation, any implied warranty or any implied warranty of fitness for a particular purpose. Microlmage Video Systems shall have the final right to determination as to the existence and cause of any defect and its appropriate adjustment in accordance with the terms of this warranty. In no event shall Microlmage Video Systems be liable for any consequential or collateral damages.

Returns

All returns **MUST** have an RMA number. Please call, fax or email for an RMA form. The RMA form will have the proper shipping address for returns.

Phone	610-754-6800
Fax	610-754-9766
Email	service@mivs.com