

TLAserX30/X60/X120

Laser Scan Micrometers

*TLAser130s/160s/1120s/230/260/
2120/Triton331/360*



Operator's Manual



Copyright © LaserLinc, Inc. 1999-2011
All rights reserved

Copyright

LaserLinc, Inc. copyrights this manual with all rights reserved. Under the copyright laws, this manual may not be reproduced in any form, in whole or part, without prior written consent of LaserLinc, Inc.

Disclaimer

LaserLinc, Inc. has reviewed this manual thoroughly in order that it will be an easy to use guide to your TLaserX30/X60/X120 laser scan micrometer. All statements, technical information, and recommendations in this manual and in any guides or related documents are believed reliable, but the accuracy and completeness thereof are not guaranteed or warranted, and they are not intended to be, nor should they be understood to be, representations or warranties concerning the product described.

Your laser scan micrometer hardware and software included with your system have been sold to you subject to the limited warranties set forth in the warranty section set forth in your quote you were issued before purchase and license agreement enclosed with the software CD. Further, LaserLinc, Inc. reserves the right to make changes in the specifications of the products described in this manual at any time without notice and without obligation to notify any person of such change.

If you have questions regarding your laser scan micrometer system or the information in this manual, please call LaserLinc, Inc. customer service department at 1-888-707-4852.

Trademarks

LaserLinc, TLaser130s, TLaser160s, TLaser230, TLaser1120s, TLaser260, Triton331, Triton360, TLaser400 and Total Vu are registered trademarks. The LaserLinc logo is a trademark of LaserLinc, Inc.

Other brands and product names mentioned in this manual may be trademarks or registered trademarks of their respective companies.

LaserLinc, Inc.

777 Zapata Dr ▪ Fairborn OH 45324

Phone: 937-318-2440 ▪ Fax: 937-318-2445

info@laserlinc.com ▪ www.laserlinc.com

Read Me First: Safety and Electromagnetic Compatibility

This chapter contains safety instructions and electromagnetic compatibility (EMC) information for the hardware it accompanies. This chapter is a supplement to the hardware documentation. Read this chapter before installing and using the scanner.

Safety Information

This section contains important safety information that you **must** follow when installing and using the hardware.

Do not operate the hardware in a manner not specified in this document and in the user documentation. Misuse of the hardware can result in a hazard. You can compromise the safety protection if the hardware is damaged in any way. If the hardware is damaged, return it to LaserLinc for repair.

Do not substitute parts or modify the hardware except as described in this document. Use the scanner only with the accessories and cables specified in the installation instructions or specifications. You must have all covers installed during operation of the scanner.

Do not operate the scanner in an explosive atmosphere or where there may be flammable gases or fumes.

Contents

Read Me First: Safety and Electromagnetic Compatibility	iii
Safety Information	iii
Laser Micrometers—Theory of Operation.....	1
Intended Use of the Equipment.	1
Compliance	2
Electromagnetic Compatibility Information	2
FCC/DOC Radio Frequency Interference Class A Compliance.....	3
Federal Communications Commission	3
Notices to User	3
Canadian Department of Communications	3
Laser Micrometers—Safety Considerations.....	4
Installation and Configuration	5
Safety Information	5
Connecting Safety Ground	6
Connecting to Power Source.....	6
TLAser130s™ / 160s™ / 1120s™ Laser Micrometers.....	7
Getting Started.....	7
130s/160s/1120s Specifications	7
Setting up the TLAser130s/160s/1120s.....	8
Mounting Hole Drawings.....	8
Cabling.....	9
TLAser230™/260™/2120™ Laser Micrometers	10
Getting Started.....	10
Specifications 230/260/2120	10
Setting up the TLAser230/260/2120.....	11
Mounting Hole Drawings.....	11
Cabling 230/260/2120.....	11
Triton331™/360™ Laser Micrometers.....	13

Getting Started.....	13
Specifications 331/360	13
Setting up the Triton331/360.....	14
Mounting Hole Drawings.....	14
Cabling 331/360.....	16
Appendix 1 Preventive Maintenance & Troubleshooting	17
Cleaning	17
Exterior Cleaning.....	17
Window Cleaning.....	17
Waveforms	18
Troubleshooting	19
Problem: Total Vu measurement reports Too Few: 4	19
Problem: Total Vu measurement reports Too Few: 6	19
Problem: Total Vu measurement reports Too Few: 0	19
Problem: Total Vu measurement reports Too Many: (any number > 8)	19
Problem: Total Vu measurement reports No Scan	20
Problem: There are many problems that are not related to the scanner.	20
Appendix 2: Hardware Specifications.....	21
Electrical	21
Environmental.....	21
Safety	22
Electromagnetic Compatibility.....	22
CE Compliance	22
Mechanical.....	22
Appendix 3 TLAs400™ PCI Micrometer Interface Card.....	23
Getting Started.....	23
Compatibility Modules	24
Connections and Connectors	24
Cleaning and Routine Maintenance.....	24
TLAs400 Card Specifications and Operating Environment	24
Hardware Installation	25
Appendix 4 Installing Total Vu Software.....	26
Installing and Activating Total Vu™ Software.....	26
Installing InstaCal™ Software.....	27
Total Vu Activation	27
Windows Vista and Windows7 notes:.....	28

Laser Micrometers—Theory of Operation

Laser scan micrometers use a laser light source to measure diameter, gap, position, width, and other dimensions. The light source is focused onto the facets of a rotating mirror (or prism) that reflects the laser beam into a collimating lens. The lens refracts the beam so that all paths of light from the mirror through the lens emerge parallel to each other. A focal lens on the other side of the measurement field focuses the incoming light onto a photocell, generating an analog voltage. When an object is placed in the measurement field, it obstructs the laser beam. When the beam is obstructed, the photocell output voltage is at its lowest level; when unobstructed, the voltage is at its highest level. As the mirror rotates, the beam scans the measurement field from one side to the other. An object in the field obstructs the laser beam, casting a shadow that causes a low output voltage for a period of time that is proportional to the size of the object. Using the speed at which the beam is traversing the measurement field as a reference, the shadow time is converted to an accurate measurement of the object's size.

Intended Use of the Equipment.

LaserLinc laser scan micrometers are intended for use in measuring inside and outside diameter, lobing, and other characteristics, for industries including (but not limited to) wire, cable, fiber, hose, tube, pipe, and centerless grinding.

Compliance

Electromagnetic Compatibility Information

This hardware has been tested and found to comply with the applicable regulatory requirements and limits for electromagnetic compatibility (EMC) as indicated in the hardware's Declaration of Conformity (DoC)*. These requirements and limits are designed to provide reasonable protection against harmful interference when the hardware is operated in the intended electromagnetic environment. In special cases, for example when either highly sensitive or noisy hardware is being used in proximity, additional mitigation measures may have to be employed to minimize the potential for electromagnetic interference.

While this hardware is compliant with the applicable regulatory EMC requirements, there is no guarantee that interference will not occur in a particular installation. To minimize the potential for the hardware to cause interference to radio and television reception or to experience unacceptable performance degradation, install and use this hardware in strict accordance with the instructions in the hardware documentation and the DoC.

If this hardware does cause interference with licensed radio communications services or other nearby electronics, which can be determined by turning the hardware off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the antenna of the receiver (the device suffering interference).
- Relocate the transmitter (the device generating interference) with respect to the receiver.
- Plug the transmitter into a different outlet so that the transmitter and the receiver are on different branch circuits.

Operation of this hardware in a residential area is likely to cause harmful interference. Users are required to correct the interference at their own expense or cease operation of the hardware.

*The Declaration of Conformity (DoC) contains important EMC compliance information and instructions for the user or installer.

Changes or modifications not expressly approved by LaserLinc could void the user's right to operate the hardware under the local regulatory rules.

FCC/DOC Radio Frequency Interference Class A Compliance

This equipment generates and uses radio frequency energy and, if not installed and used in strict accordance with the instructions in this manual, may cause interference to radio and television reception. Classification requirements are the same for the Federal Communications Commission (FCC) and the Canadian Department of Communications (DOC). This equipment has been tested and found to comply with the following two regulatory agencies:

Federal Communications Commission

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at user's expense.

Notices to User

Changes or modifications not expressly approved by LaserLinc could void the user's authority to operate the equipment under the FCC Rules.

This device complies with the FCC rules only if used with shielded interface cables of suitable quality and construction. LaserLinc used such cables to test this device and provides them for sale to the user. The use of inferior or non-shielded interface cables could void the user's authority to operate the equipment under the FCC rules.

If necessary, consult LaserLinc or an experienced radio/television technician for additional suggestions. The following booklet prepared by the FCC may also be helpful: *Interference to Home Electronic Entertainment Equipment Handbook*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

Canadian Department of Communications

This Class-A digital apparatus complies with Canadian ICES-001

Cet appareil numérique de la classe-A est conforme à la norme NMB-001 du Canada

Laser Micrometers—Safety Considerations

Be sure to avoid direct exposure of human eyes to laser beams emitted from laser diodes. Even though barely visible and/or invisible to the human eye, they can be quite harmful. In particular, avoid looking directly into a laser diode or collimated beam along its optical axis when the diode is activated.

The scanner must be placed in a location where it is easy for the operator to disconnect the power cord from either the scanner or from where it is plugged into in case of an emergency.

LaserLinc, Inc. certifies compliance with U.S. safety regulations (21 CFR Chapter I, Subchapter J) on laser products, as stipulated by the U.S. Department of Health and Human Services. The LaserLinc, Inc. products shown here correspond to the category CLASS II LASER PRODUCT in the regulation.

The following are warnings and graphic symbols that are adhered to the TLaserX30/X60/X120 scanners.



WAARSCHUWING LASER STRALING – KIJK NIET IN DE STRAAL



Halfgeleider Laser: 600-700nm Maximum Vermogen Minder Dan 1,0mW Klas II Laser Produkt

 – This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on the product, refer to the [Read Me First: Safety and Electromagnetic Compatibility](#) chapter for precautions to take.

Installation and Configuration

This chapter describes how to prepare and operate the scanner. Before connecting the scanner to a power source, read this chapter and the [Read Me First: Safety and Electromagnetic Compatibility](#) chapter.

Safety Information



– Caution: Before undertaking any maintenance, carefully read the following caution notices.

This equipment contains voltage hazardous to human life and safety, and is capable of inflicting personal injury.

- Scanner Grounding—The scanner requires a connection from the premise wire safety ground to the chassis ground. The earth safety ground must be connected during use of this equipment to minimize shock hazards. Refer to the [Connecting Safety Ground](#) section for instructions on connecting safety ground.
- Live Circuits—Operating personnel **must not** remove protective covers when operating the scanner. Adjustments and service to internal components must be undertaken **only** by LaserLinc personnel.
- Explosive Atmosphere—**Do not** operate the scanner in conditions where flammable gases are present. Under such conditions, this equipment is unsafe and may ignite the gases or gas fumes.
- Part Replacement—Only service this equipment with parts that are exact replacements, both electrically and mechanically. Contact LaserLinc for replacement part information. Installation of parts with those that are not direct replacements may cause harm to personnel operating the scanner. Furthermore, damage or fire may occur if replacement parts are unsuitable.

- Modification—Do *not* modify any part of the scanner from its original condition. Unsuitable modifications may result in safety hazards.

Connecting Safety Ground



– Caution The scanner is designed with a three-position inlet that connects the cord set ground line to the chassis ground. To minimize shock hazard, make sure the electrical power outlet you use to power the scanner has an appropriate earth safety ground.

Connecting to Power Source



– Caution To deactivate power completely, you **must** disconnect the AC power cable..

Attach input power through the AC inlet using the appropriate AC power cable supplied. To locate the AC inlet, Refer to the diagram for your specific scanner.

TLAser130s™ / 160s™ / 1120s™ Laser Micrometers

Getting Started

Be gentle with your scanner, it is a precision optical instrument. Rough treatment can reduce the precision, and the life expectancy of your scanner.



TLAser130s, TLAser160s, and TLAser1120s, all shown without rail.

130s/160s/1120s Specifications

	TLASER130S	TLASER160S	TLASER1120S
Measurement Range	0.007" – 1" (0.17mm – 25.4mm)	0.016" – 2" (.4mm – 51mm)	0.028" – 4" (0.7mm – 102mm)
Maximum Measurement Size	1.18" (30mm)	2.36" (60mm)	4.72" (120mm)
Measurements per second	1,600 standard / 4,000 optional	1,600 standard / 4,000 optional	1,600 standard / 4,000 optional
Resolution	.000001" (.025µm)	0.016" – 2" (.4mm – 51mm)	.000001" (.025µm)
Repeatability*			
Single Scan	±0.002" (±0.0508mm)	.000001" (.025µm)	±0.008" (±0.203mm)
Two Second	±0.00001" (±.25µm)	±0.004" (±0.102mm)	±0.00004" (±1.0µm)
Positional Error	±0.0001" (±2.54µm) within center 1" (25.4mm)	±0.00002" (±0.5µm)	±0.0004" (±10µm) within center 4" (101.6mm)

	TLASER130S	TLASER160S	TLASER1120S
Dimensions (H x W x D)			
Transmitter	4.95" x 8.75" x 2" (126mm x 222mm x 51mm)	7.5" x 8.5" x 2" (191mm x 216mm x 51mm)	10.25" x 10.7" x 2" (260mm x 272mm x 51mm)
Receiver	4.95" x 4" x 2" (126mm x 102mm x 51mm)	7.5" x 4" x 2" (191mm x 102mm x 51mm)	10.25" x 6.5" x 2" (260mm x 165mm x 51mm)
Approx. Weight	11.5 lbs (5.2 kg)	16lbs (7.25kg)	21 lbs (9.5kg)

Run up to four TLAser130s/160s/1120s micrometers from one card and as many as 16 from one PC using four cards.

Laser Class II visible red laser diode wavelength is 675nm.

*Repeatability applies within the measurement range.

Setting up the TLAser130s/160s/1120s

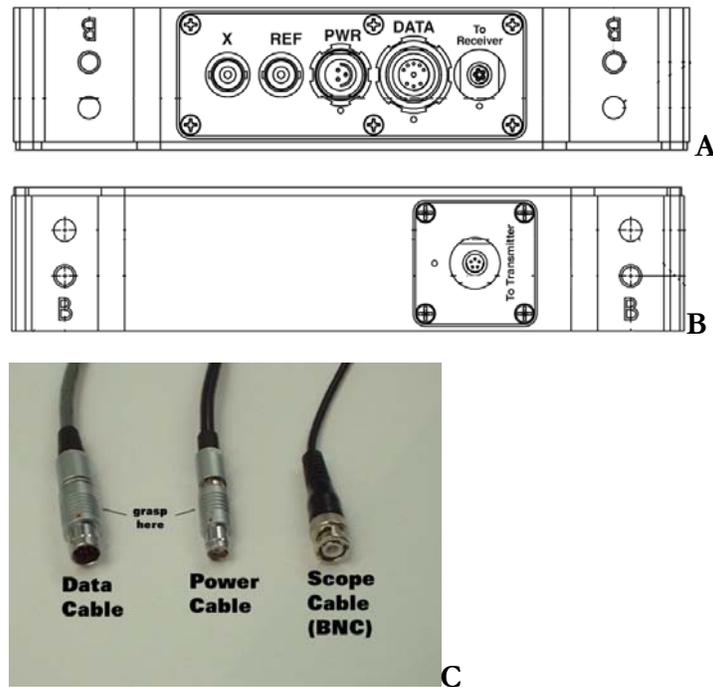
Mounting Hole Drawings

http://www.laserlinc.com/Mounting_drawings/LaserLinc-TLAser130s_mount.pdf

http://www.laserlinc.com/Mounting_drawings/LaserLinc-TLAser160s_mount.pdf

http://www.laserlinc.com/Mounting_drawings/LaserLinc-TLAser1120s_mount-inches.pdf

Orientation—Any orientation is acceptable, as long as the mounting is secure and free from vibration.

Cabling

Transmitter (A), receiver (B), and cables (C).

Power and Data—both are keyed, and cannot be connected incorrectly. Connectors (plugs), if oriented correctly, will slide snugly into sockets. To remove, grasp metal plug housing and pull directly away from scanner. Plugs should slide out. The connection is snug, not tight. If the plug does not pull out fairly easily, you are not grasping the plug in the correct place; refer to illustration and try again.

If not already connected, insert cable from transmitter head (smaller of the two) into the mating connector of the receiver head (larger). Gently press and turn until the connector snaps on.

Test Ports—The test ports are designed for waveform output to an oscilloscope. The connection is via BNC connector. For a discussion of the waveforms, see the Troubleshooting chapter.

A separate air purge is available. The air purge has multiple purposes. It provides a smaller aperture from which the laser light is emitted and received, thus preventing splashing fluids from contaminating the windows. And it provides a positive outward air pressure to the windows to prevent contaminants from accumulating on the windows. Lastly, an air purge provides protection to the windows from unwieldy product as it passes through the scan field; such as end-of-spool conditions.

To prevent moisture and oil from collecting on the windows, use of clean, dry shop air is imperative.

TLAser230™/260™/2120™ Laser Micrometers

Getting Started

Be gentle with your scanner, it is a precision optical instrument. Rough treatment can reduce the precision, and the life expectancy of your scanner.



TLAser230, TLAser260, and TLAser2120

Specifications 230/260/2120

	TLASER230	TLASER260	TLASER2120
Measurement	0.007" – 1"	0.016" – 2"	0.028" – 4"
Range	(0.17mm – 25.4mm)	(0.4mm – 51mm)	(0.7mm – 102mm)
Maximum Measurement Size	1.18" (30mm)	2.36" (60mm)	4.72" (120mm)
Measurements per second	3,200 (1,600 per axis) standard / 8,000 (4,000 per axis) optional	3,200 (1,600 per axis) standard / 8,000 (4,000 per axis) optional	3,200 (1,600 per axis) standard / 8,000 (4,000 per axis) optional
Resolution	.000001" (.025µm)	.000001" (.025µm)	.000001" (.025µm)
Repeatability*			
Single Scan	±0.002" (±0.0508mm)	±0.004" (±0.102mm)	±0.008" (±0.203mm)
Two Second	±0.00001" (±.25µm)	±0.00002" (±.5µm)	±0.00004" (±1.0µm)

	TLASER230	TLASER260	TLASER2120
Positional Error	± 0.0001 " ($\pm 2.54\mu\text{m}$) within center 1" (25.4mm)	± 0.0002 " ($\pm 5\mu\text{m}$) within center 2" (51mm)	± 0.0004 " ($\pm 10\mu\text{m}$) within center 4" (101.6mm)
Dimensions (H x W x D)	10.75" x 13.25" x 2.15" (273mm x 337mm x 55mm)	19" x 18" x 3" (478mm x 447mm x 76mm)	22" x 20.25" x 3" (561mm x 514mm x 76mm)
Approx. Weight	20 lbs (9.1kg)	38 lbs (17.2kg)	53 lbs (24kg)
Part aperture	3" x 4" (without air purge)	5" x 6" (without air purge).	8" x 10" (without air purge).

Run up to four TLAser230/260/2120 micrometers from one card and as many as 16 from one PC using four cards.

Laser Class II visible red laser diode wavelength is 675nm.

*Repeatability applies within the measurement range.

Setting up the TLAser230/260/2120

Mounting Hole Drawings

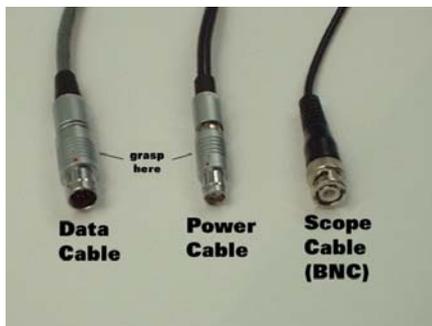
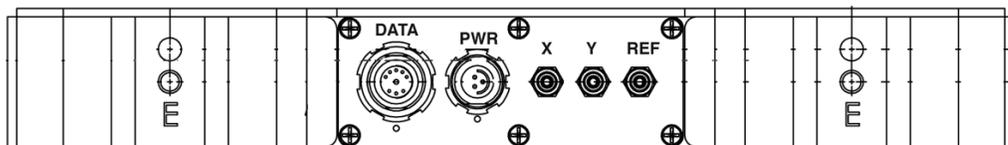
http://www.laserlinc.com/Mounting_drawings/LaserLinc-TLASer230_mount.pdf

http://www.laserlinc.com/Mounting_drawings/LaserLinc-TLASer260_mount-inch.pdf

http://www.laserlinc.com/Mounting_drawings/LaserLinc-TLASer2120_mount-inch.pdf

Orientation—Any orientation is acceptable, as long as the mounting is secure and free from vibration.

Cabling 230/260/2120



230/260/2120 connector panel and cables.

Power and Data—both are keyed, and cannot be connected incorrectly. Connectors (plugs), if oriented correctly, will slide snugly into sockets. To remove, grasp metal plug housing and pull directly away from scanner. Plugs should slide out. The connection is snug, not tight. If the plug does not pull out fairly easily, you are not grasping the plug in the correct place; refer to illustration and try again.

Test Ports—The test ports are designed for waveform output to an oscilloscope. The connection is via BNC connector. For a discussion of the waveforms, see the Troubleshooting chapter.

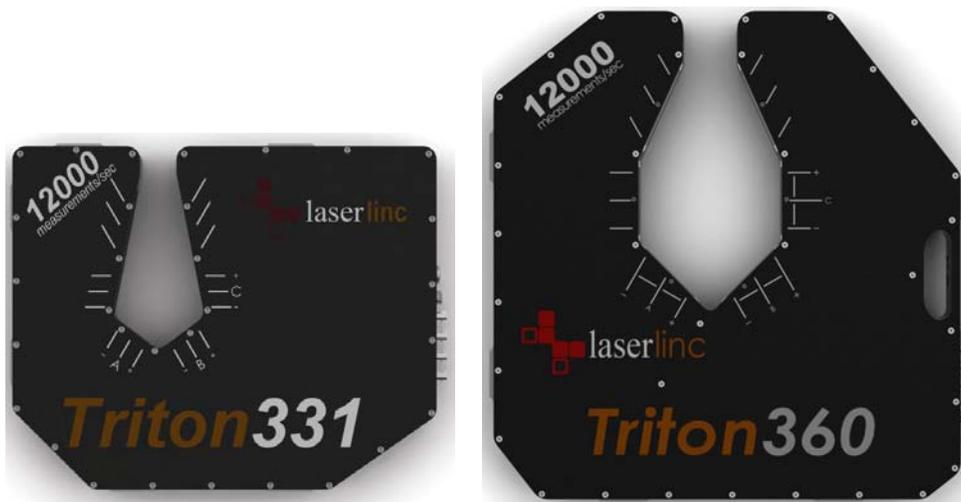
A separated air purge is available. The air purge has multiple purposes. It provides a smaller aperture from which the laser light is emitted and received, thus preventing splashing fluids from contaminating the windows. And it provides a positive outward air pressure to the windows to prevent contaminants from accumulating on the windows. Lastly, an air purge provides protection to the windows from unwieldy product as it passes through the scan field; such as end-of-spool conditions.

To prevent moisture and oil from collecting on the windows, use of clean, dry shop air is imperative.

Triton331™/360™ Laser Micrometers

Getting Started

Be gentle with your scanner, it is a precision optical instrument. Rough treatment can reduce the precision, and the life expectancy of your scanner.



Triton331, Triton360

Specifications 331/360

	TRITON331	TRITON360
Measurement Range	.010" – 1.18" (.25mm – 30mm)	0.016" – 2" (0.4mm – 51mm)
Maximum Measurement Size	1.18" (30mm)	2.36" (60mm)
Measurements per second	4,800 standard/12,000 optional (1,600/4,000 per axis)	4,800 standard/12,000 optional (1,600/4,000 measurements per second per axis)
Resolution	.000001" (.025µm)	.000001" (.025µm)

	TRITON331	TRITON360
Repeatability*		
Single Scan	± 0.002 " (± 0.0508 mm)	± 0.004 " (± 0.102 mm)
Two Second	± 0.00001 " (± 0.25 μ m)	± 0.00003 " (± 0.762 μ m)
Positional Error	± 0.0001 " (± 2.54 μ m) within center 1" (25.4mm)	± 0.0002 " (± 5.08 μ m) within center 2" (51mm)
Dimensions (H x W x D)	13"H x 16"W x 2"D / (335mm x 409mm x 51mm)	21"H x 21"W x 2"D / (533mm x 533mm x 51mm)
Approx. Weight	22lbs (10kg)	41lbs (18.6kg)

Run up to four Triton331/360 micrometers from one card, with up to 16 from one PC using four cards.

Laser Class II visible red laser diode wavelength is 675nm.

*Repeatability applies within the measurement range.

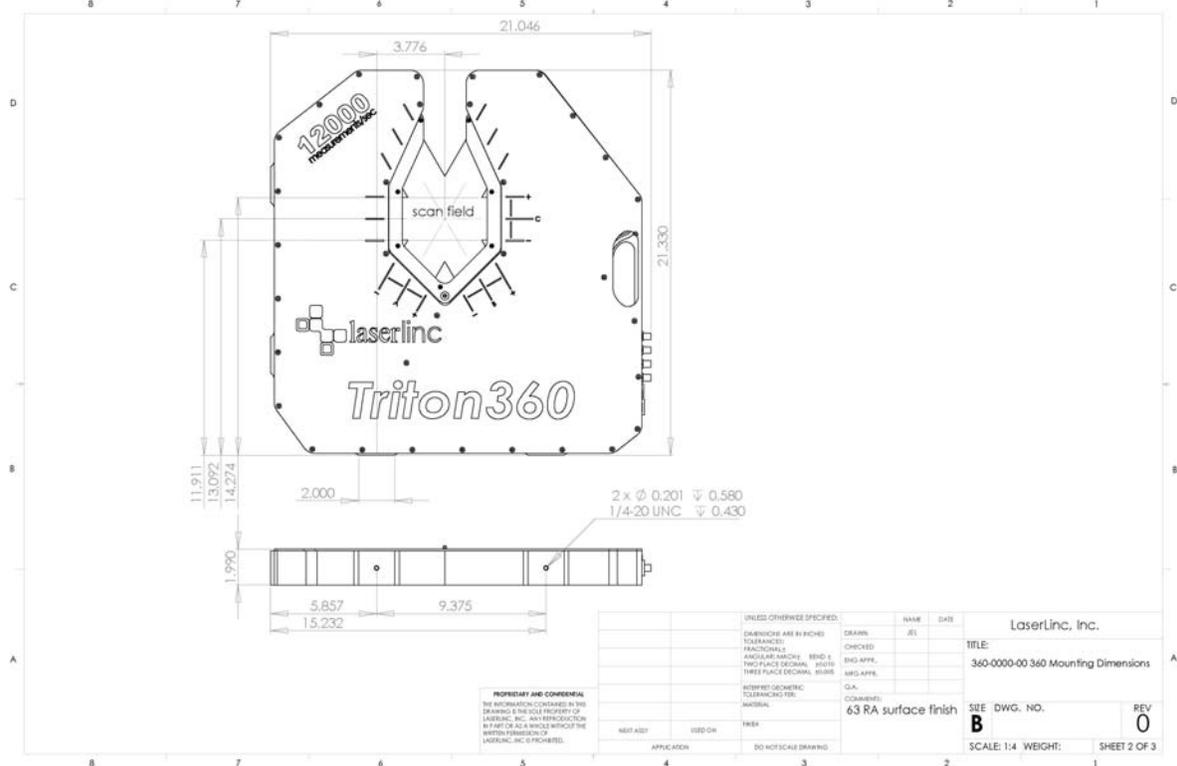
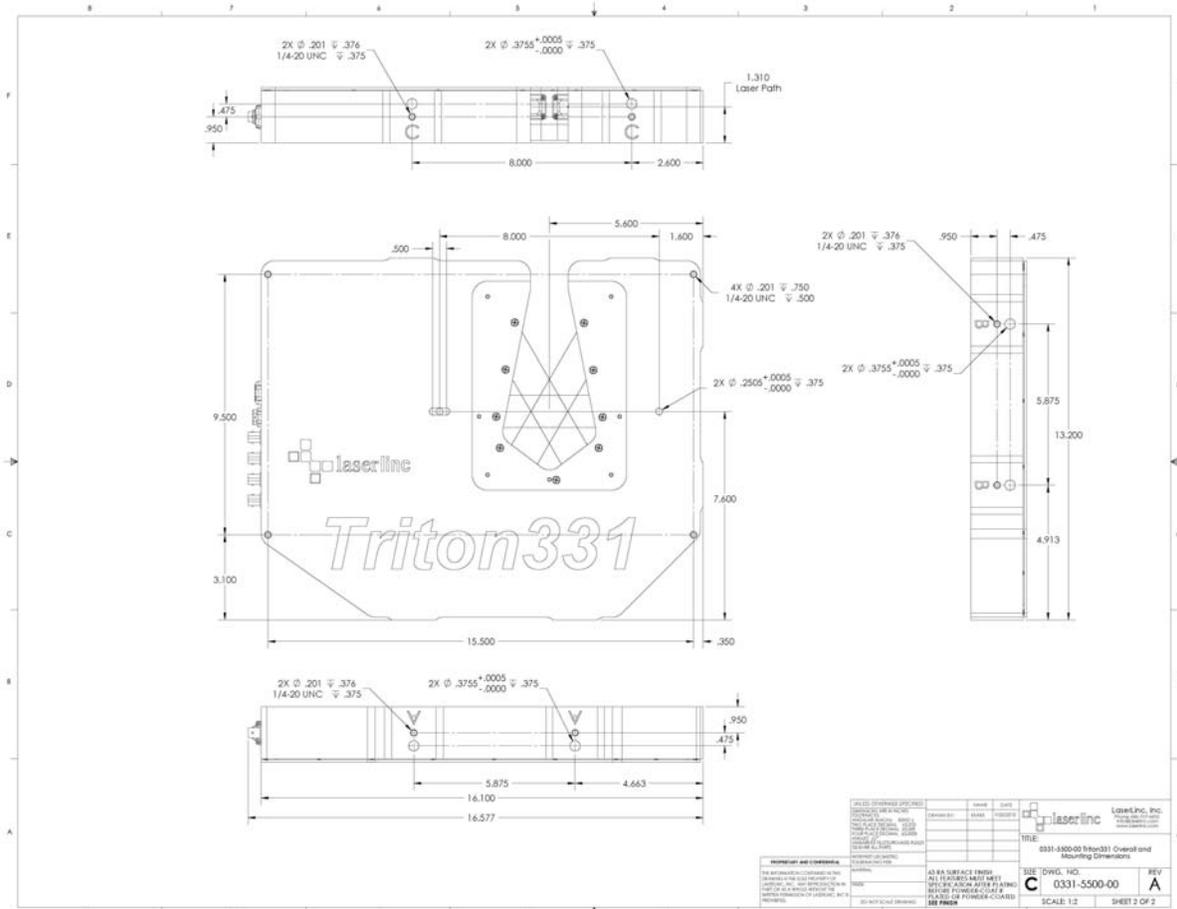
Setting up the Triton331/360

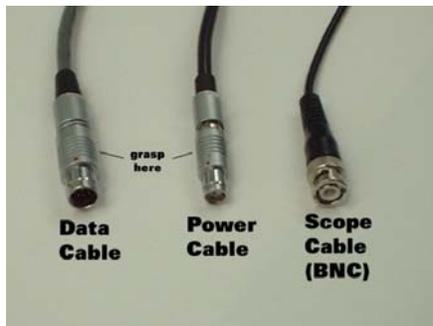
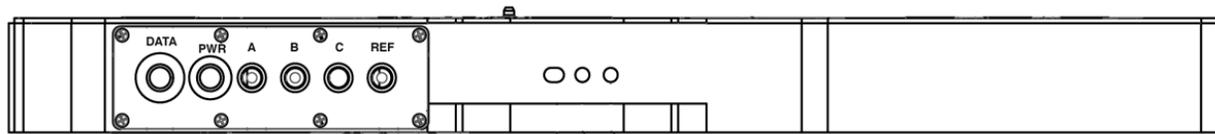
Mounting Hole Drawings

http://www.laserlinc.com/Mounting_drawings/LaserLinc-Triton331_mount.pdf

http://www.laserlinc.com/Mounting_drawings/LaserLinc-Triton360_mount-inch.pdf

Orientation—Any orientation is acceptable, as long as the mounting is secure and free from vibration.



Cabling 331/360

331/360 connector panel and cables.

Power and Data—both are keyed, and cannot be connected incorrectly. Connectors (plugs), if oriented correctly, will slide snugly into sockets. To remove, grasp metal plug housing and pull directly away from scanner. Plugs should slide out. The connection is snug, not tight. If the plug does not pull out fairly easily, you are not grasping the plug in the correct place; refer to illustration and try again.

Test Ports—The test ports are designed for waveform output to an oscilloscope. The connection is via BNC connector. For a discussion of the waveforms, see the Troubleshooting chapter.

A separated air purge is available. The air purge has multiple purposes. It provides a smaller aperture from which the laser light is emitted and received, thus preventing splashing fluids from contaminating the windows. And it provides a positive outward air pressure to the windows to prevent contaminants from accumulating on the windows. Lastly, an air purge provides protection to the windows from unwieldy product as it passes through the scan field; such as end-of-spool conditions.

To prevent moisture and oil from collecting on the windows, use of clean, dry shop air is imperative.

Appendix 1 Preventive Maintenance & Troubleshooting

This chapter describes basic maintenance procedures you can perform on the TLaserX30/X60/X120 and Triton331/360 scanners.

Read the [Read Me First: Safety and Electromagnetic Compatibility](#) section before attempting any of the procedures in this chapter.

Cleaning

Exterior Cleaning

Clean dust and dirt from the scanner exterior as needed, based on the operating environment. Periodic cleaning increases reliability and cooling performance.



– **Caution:** **Do not** wash the connectors. Cover these components while cleaning the scanner.

Do not use harsh chemical cleaning agents; they may damage the scanner's finish. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Clean the exterior surfaces of the scanner with a dry lint-free cloth or a soft-bristle brush. If any dirt remains, wipe with a cloth moistened in a mild soap solution or a cleaning agent such as Fantastic or Krud Kutter. Remove any soap residue by wiping with a cloth moistened with clear water. **Do not** use abrasive compounds on any part of the scanner.

Window Cleaning

The windows of the TLaserX30/X60/X120 and Triton331/360 must always be clean to ensure the highest measurement accuracy. **ALWAYS** use a new swab or wipe for each window.

1. To clean the windows:
 - 1.1. If applicable, remove the air purge or window guard.

- 1.2 Inspect the windows for specks of dirt or (especially) metal.

If the scanner is powered, any specks of dirt should glow under the illumination of the laser. Any loose dirt should be blown off of the windows. If loose dirt, especially metal, is wiped across the windows, scratching may result. If lung power is not adequate, try canned air or compressed air. Do not use excessive air pressure. You do not want to scour the window, just blow off any loose dirt.

- 1.3 Clean each of the two, four or six windows with a cotton swab or Kim-wipe (damp, not dripping, with Windex, ethanol (denatured is fine), or reagent acetone).

If using acetone, exercise caution to see that it is applied only to the windows. Acetone is a strong solvent, and will dissolve plastic and paint, including the silk-screened logo on the scanner. Remember, the wipe or swab should be DAMP not DRIPPING.

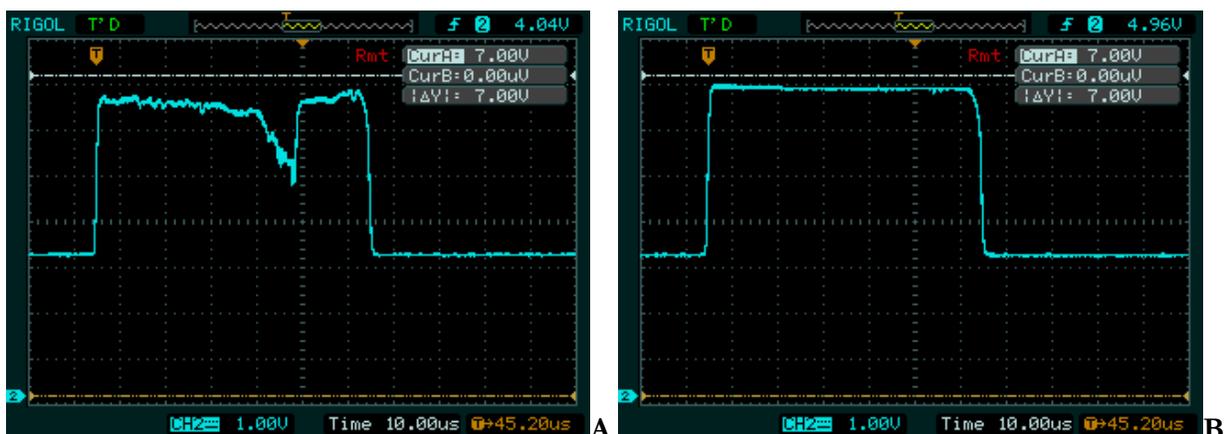
- 1.4 Wipe each window once, from side to side. Do NOT scrub. Do not wipe from top to bottom.

If using Windex, a dry swab or wipe will be necessary to dry the window (again, from side to side, once. DO NOT SCRUB). All other cleaners (solvents) will dry quickly on their own. Windex will leave spots if allowed to dry on its own.

- 1.5 If applicable, replace the air purge or window guard.

Note: There are **NO** user-serviceable parts inside scanners—removing the cover will **VOID** your warranty.

Waveforms



Dirty waveform (A), clean waveform (B).

Troubleshooting

Problem: Total Vu measurement reports Too Few: 4

Possible Causes:

There is no part in the field.

1. Check that the part is in the field and illuminated by the laser.
2. Check each axis, via the test port, for correct waveform.

One axis is completely obstructed.

1. Check that there is nothing obstructing either axis.
2. Check each axis, via the test port, for correct waveform.

Problem: Total Vu measurement reports Too Few: 6

Possible Cause:

The part is in the field in one axis, but not the other.

1. Check each axis, via the test port, for correct waveform.

Problem: Total Vu measurement reports Too Few: 0

Possible Causes:

The laser field is obstructed.

1. Check that the air purge is completely inserted into the scanner.
2. Check each axis, via the test port, for correct waveform.

Problem: Total Vu measurement reports Too Many: (any number > 8)

Possible Causes:

There is dirt on a window.

1. Remove the air purge and inspect for spots, dots, or glowing flecks on any of the windows.

2. Follow the window cleaning procedure described earlier in this document.
3. Check each axis, via the test port, for correct waveform.

There is more than one part in the field.

1. Check for lint attached to the air purge.
2. Check for any additional fibers in the scan field.
3. Check each axis, via the test port, for correct waveform.

Problem: Total Vu measurement reports No Scan

Possible Causes:

The scanner is not powered.

1. Check that the power cord is completely plugged in at both ends, and that it is not plugged into a dead circuit (e.g. a power strip that is turned off).

The scanner data cable is not connected.

1. Check that the scanner data cable is plugged into the scanner, and into the TLAser400 in the PC.

Problem: There are many problems that are not related to the scanner.

Possible Causes:

Please contact LaserLinc for further help.

Appendix 2: Hardware Specifications

This appendix contains specifications for the TLAser130s/160s/1120s/230/260/2120/Triton331/360.



– Caution: Specifications are subject to change without notice.

Electrical

Input voltage range	100 – 240 VAC
Operating voltage range*	90 – 264 VAC
Input frequency	50/60 Hz
Operating frequency range ¹	47 – 63 Hz
Input current rating	0.25 A
Over current protection	2 A 250 VAC fuse (Internal – NOT user replaceable)
Power disconnect	The AC power cable provides main power disconnect.

*The operating range is guaranteed by design.

Environmental

Operating temperature	41°F to 104°F (5°C – 40°C)
Operating relative humidity	Maximum 80% relative humidity for temperatures up to 31°C, decreasing linearly to 50% at 40°C
Installation category	II
Pollution degree	2
Protection class	Class 1 – grounded
Operating location	Indoor Use Only
Maximum altitude	2000 m (at 25°C ambient)

Safety

This product meets the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use.

IEC 61010-1, EN 61010-1

UL 61010-1, CSA 61010-1

Electromagnetic Compatibility

This product meets the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use.

EN 61326-1 (IEC 61326-1): Class A emissions, Basic immunity

EN 55011 (CISPR11): Group 1, Class A emissions

FCC 47 CFR Part 15B: Class A emissions

ICES-001: Group 1, Class A emissions

CE Compliance

This product meets the essential requirements of applicable European Directives as follows.

2006/95/EC; Low Voltage Directive (safety)

2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Mechanical

Dimensions and weight are in the manual with their respective hardware.

Appendix 3 TLAser400™ PCI Micrometer Interface Card

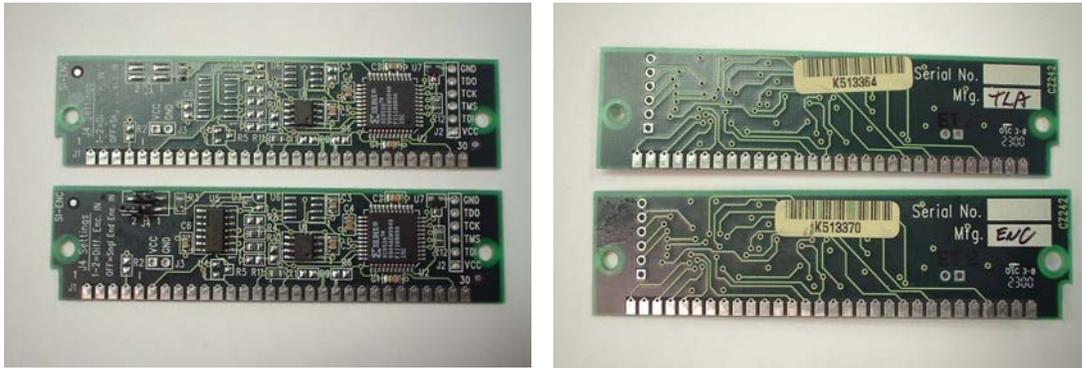
Getting Started



TLAser400 PCI (no modules installed).

Your TLAser400 card will arrive with compatibility modules installed. You should do a visual inspection to make sure that they are still firmly in their slots.

Compatibility Modules



Front of compatibility modules; (top) TLAser—note: most chips not populated); (bottom) encoder—note: jumper in upper left.

Back of compatibility module; (top) TLAser—note: Mfg. “TLA”; (bottom) encoder—note: Mfg. “ENC”.

Connections and Connectors

The only external port on the TLAser400 interface card is a 37-pin D-style, female (socket) connector. The cable to any scanner(s) should be connected to this port.

Note: The PC should be turned OFF before this connection is made or broken.

Cleaning and Routine Maintenance

There is no routine cleaning or maintenance required for the TLAser400 interface card. Any routine cleaning of the PC should be sufficient to keep the TLAser400 interface card sufficiently clean.

TLAser400 Card Specifications and Operating Environment

Number of channels	4
Interface	PCI 2.1 or 2.2
Resolution	0.1ns, based upon event average
Single event resolution	2ns
Measurement rate	> 50,000 measurements/second

Resultant measurement accuracy is dependent upon the individual micrometer

Operating temperature: 45°F–110°F

Storage Temp: 0°F–150°F

Humidity: 10% to 90% relative, non-condensing

Hardware Installation

Note: More detailed installation instructions are provided in the quick-start guide that was included with your hardware.

1. Turn off the target PC.
2. Remove the cover to gain access to the back plane.
3. Find an open PCI slot.

PCI slots generally have white/cream colored connectors. ISA slots generally have dark brown or black connectors.

4. Remove the back panel slot cover.
5. Insert the card into the slot.

Make sure that the card edge connector is aligned with the back plane connector.

6. Press firmly.

You should feel the card snap into place.

7. To secure the TLASer400 PCI in its slot, use the screw that was originally holding the back panel slot cover in place.
8. Replace the PC cover
9. Power the PC.
10. Refer to the next chapter, Installing Total Vu Software, for further installation instructions.

Appendix 4 Installing Total Vu Software

Installing and Activating Total Vu™ Software

The first step for installing a Total Vu system is to install the software.

1. Place the CD supplied by LaserLinc into the computer's CDROM drive.
 - 1.1 If the Total Vu installation program does not start automatically, open a file browser;
 - 1.2 Browse to the root directory of the installation CD;
 - 1.3 Double-click on the Setup.exe icon to proceed (See Figure 1).
 - 1.4 Follow all of the Defaults.

It is not necessary to reboot the computer after installing Total Vu.

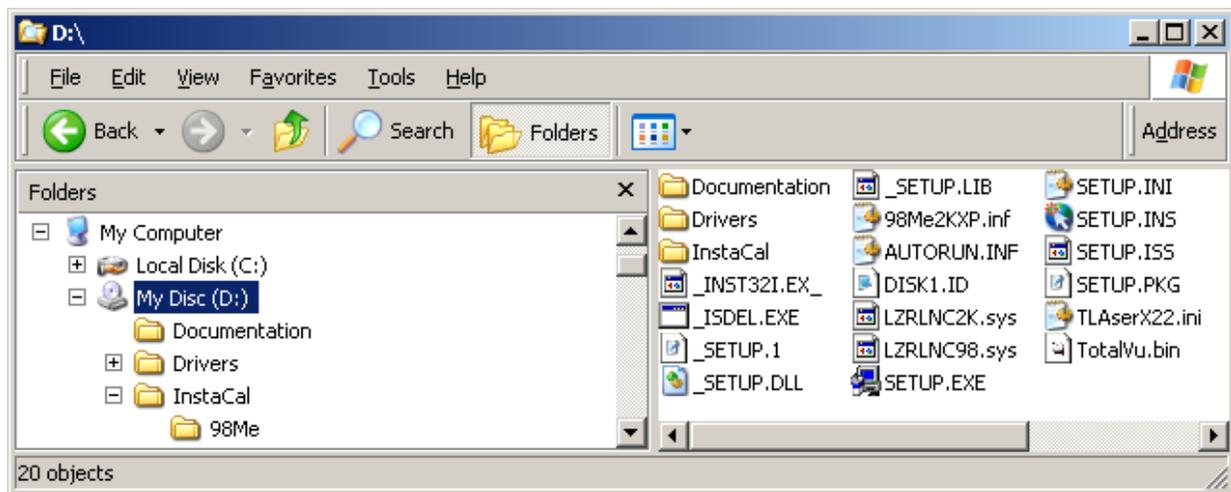


Figure 1. Root Directory on a Total Vu Installation CD

Installing InstaCal™ Software

1. After installing Total Vu software, go to the InstaCal directory

The InstaCal directory is located in the new Total Vu directory C:\Program Files\LaserLinc\Total Vu directory. Figure 2.

2. Double-click on the .exe file to install the InstaCal Software.
3. After the InstaCal installation is complete, restart the computer.

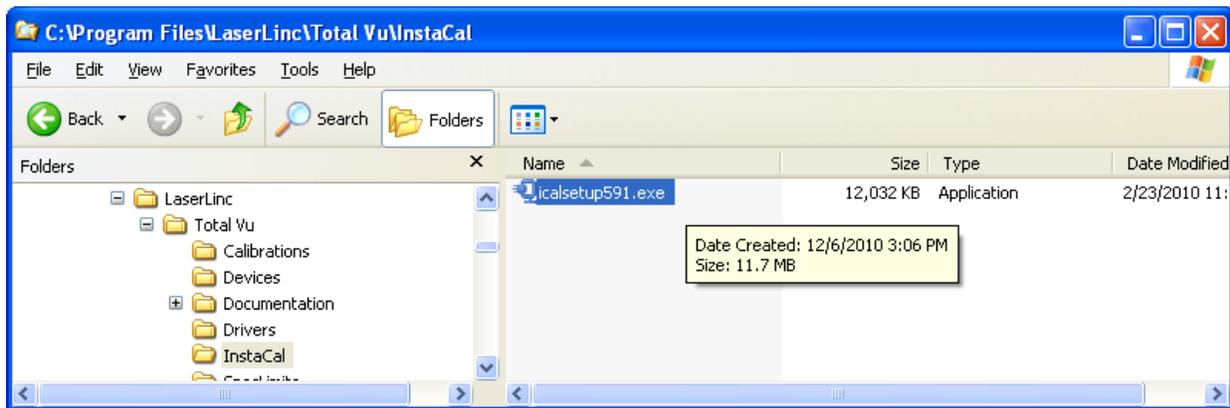


Figure 2. The InstaCal Folder In The C:\Program Files\LaserLinc\Total Vu Folder

Total Vu Activation

Once the installation of both Total Vu and InstaCal are complete, it's time to start Total Vu and begin the activation process.

1. Go to: Programs>All Programs>LaserLinc> Total Vu to start the Total Vu software.

You will receive a license screen (Figure 3).

- 1.1 Take a screen shot or write down the site code and the MID (Machine ID).

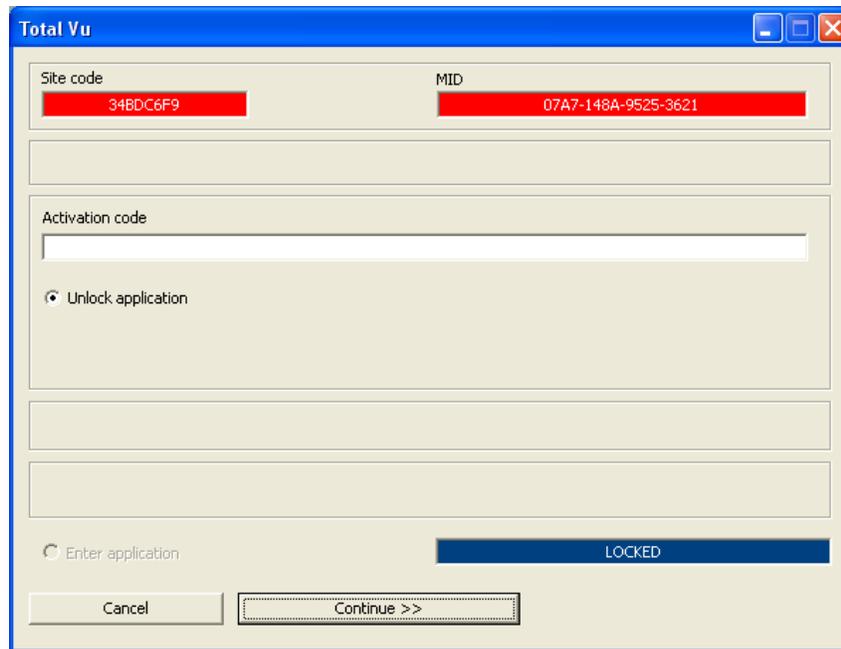


Figure 3. Total Vu license screen.

2. Contact LaserLinc technical support by calling 937-318-2440, or e-mail the site code and MID to info@laserlinc.com.

LaserLinc will supply you with the required Activation Code for your copy of Total Vu.

When the software installation is completed, proceed to the Quick Start guide for hardware installation.

Windows Vista and Windows7 notes:

If you are installing Total Vu on either Windows Vista or Windows 7, please read the following instructions:

Your operating system must be a 32 bit version of either Windows Vista or Windows 7. We recommend that you set the system theme to Windows Classic.

1. Install Total Vu and InstaCal (must be version 5.91 or higher) from the CD.

See [Installing and Activating Total Vu™ Software](#) above.

2. To set up Windows XP compatibility, locate the Total Vu.exe file.

(Generally in C:/Program Files/LaserLinc/Total Vu)

- 2.1. Right click on the icon.

A pull-down menu will appear.
- 2.2 From the pull-down menu, choose **Properties**.

A **Properties** dialog will open.
- 2.3 Choose the settings to run Total Vu in Windows XP compatible mode.
- 2.4 Close the **Properties** dialog.
3. To change default settings for file extensions and other parameters, open the **Control Panel**.
 - 3.1. Double-click the **Folder Options** icon
 - 3.1.1. Select the **View** tab
 - 3.1.2 Uncheck **Hide extensions for known file types**.
 - 3.1.3 Check box next to **Display contents of system folders**.
 - 3.1.4 Click radio button next to **Show hidden files and folders**.

Answer yes if the system warns you about displaying hidden files.
 - 3.2 If using Vista, double-click the **Users Account** icon.
 - 3.2.1 **Disable User Account Control**

This stops the system from asking OK to continue each time a change is made.
 - 3.3 If using Win7, double-click the **Users Account** icon
 - 3.3.1 Under **Change Account Control**, move slider to **Never Notify**.
4. To get XP-style menus in either Vista or Win7, select **Organize > Layout**.
- 5.1 To disable offline files, open the **Control Panel**.
 - 5.1 Double-click the **Index Options** icon.
 - 5.2 Locate the entry for **Index location**.
 - 5.3 Deselect **Offline Files**.

5.4 Select C: Disable Offline files.

NOTE: In Vista, No data can be written into the program files directory. For collected data, a virtual location is created in User\%user%\AppData\Local\Virtual Store\ProgramFiles\Laserline\Total Vu .