

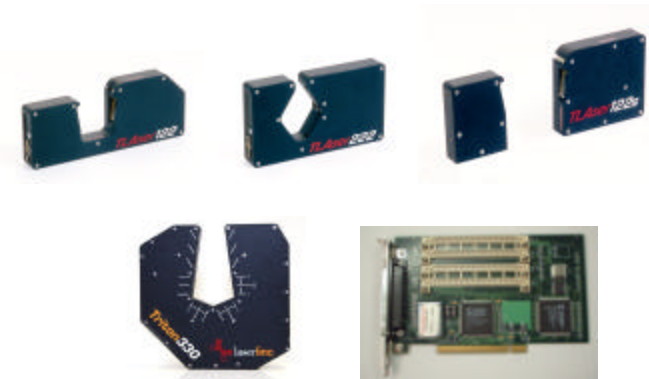


TLAserX22 / Triton3XX, TLAser400™

Laser Scan Micrometers & interface card

(122 / 222 / 122s, 312, 330, 400)

Operator's Manual



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LaserLinc, Inc. has reviewed this manual thoroughly in order that it will be an easy to use guide to your TLAserX22/3xx 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 diskette or 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.

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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 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.

Laser Micrometers – Safety Considerations

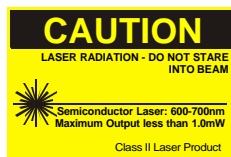
Be sure to avoid direct exposure of human eyes to laser beams emitted from laser diodes. Even though barely visible and/or invisible to the human eye, they can be quite harmful. In particular, avoid looking directly into a laser diode or collimated beam along its optical axis when the diode is activated.

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 X22/3xx scanners.

AVOID EXPOSURE - Laser radiation is emitted from this aperture

Caution - Laser radiation when open
DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS



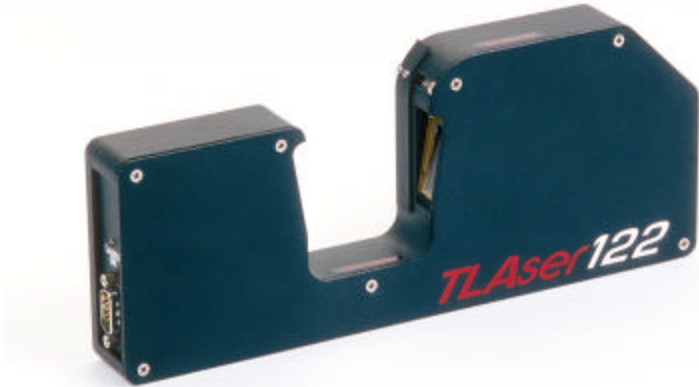
WAARSCHUWING
LASER STRALING – KIJK
NIET IN DE STRAAL



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

TLAser122™ Laser Micrometer

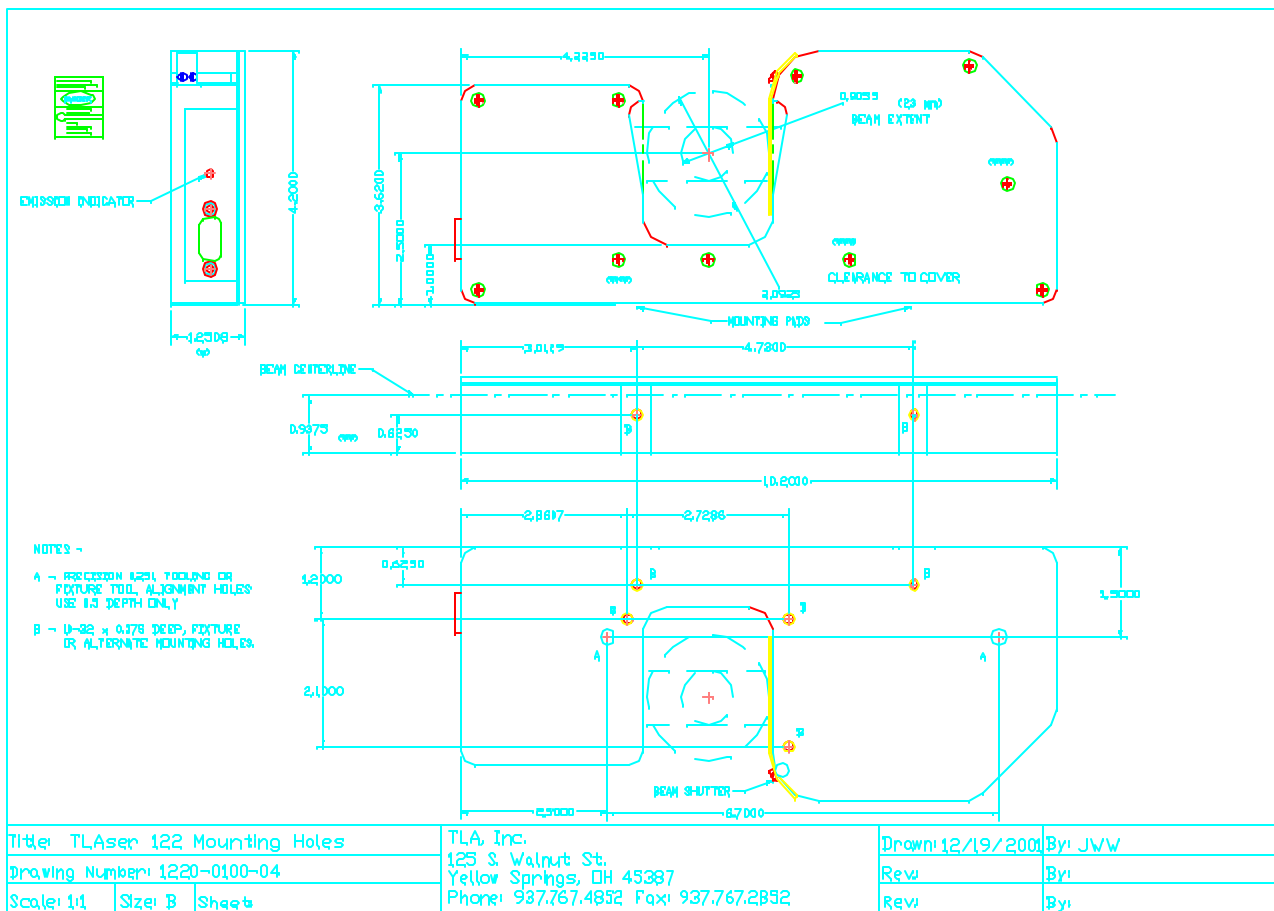
Getting Started TLAser122



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

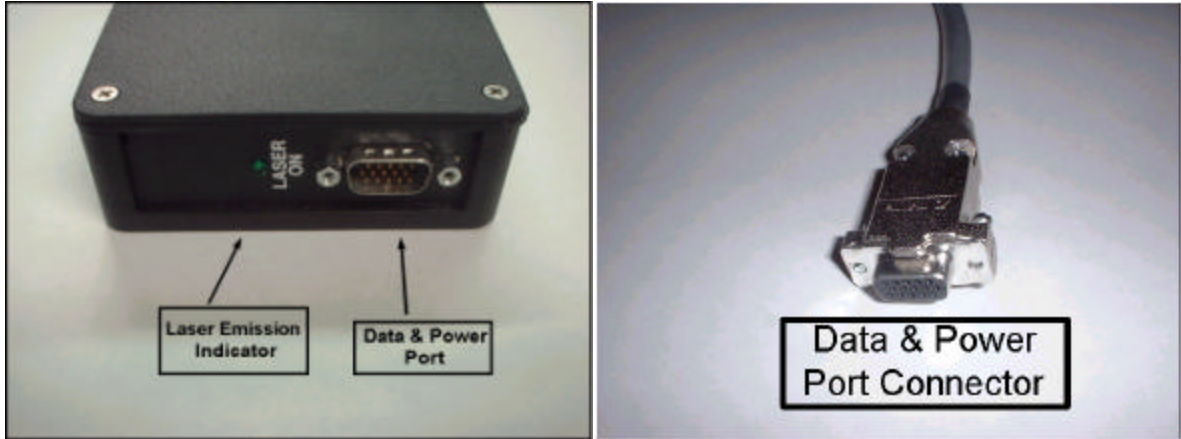
Mounting TLAser122

- Mounting Hole Drawings – http://www.laserlinc.com/gauge_info/LaserLinc-TLAser122_mount.pdf



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

Connections and Cabling TLAser122



- Power and Data Port - the D-style connector is keyed and cannot be connected incorrectly. DO NOT force the cable connector into the plug as damage may occur. Check the orientation if resistance is felt. The connector, if oriented correctly, will slide snugly into the socket. Jackscrews should be connected to prevent pullout. To remove, loosen jackscrews and grasp the metal plug housing and pull directly away from the scanner.
- Laser Emission Indicator – When illuminated green, indicates that the device is active and lasers are on. Please see caution and warning labels adhered to gauge regarding handling and dangers associated with laser devices.

122 Air Purge



- The air purge has multiple purposes; 1) it provides a smaller aperture from which the laser light is emitted and received, thus preventing splashing fluids from contaminating the windows, 2) provides a positive outward air pressure to the windows to prevent contaminants from accumulating on the windows. It is imperative that 'clean dry shop air' be used to prevent moisture and oil from collecting on the windows, 3) it provides protection to the windows from unwieldy product as it passes through the scan field; such as 'end of spool' conditions.
- To insert the air purge, line up the dowel pin with the circular groove under the scanner and allow it to slide gently into place. The block is held in place by magnets. Make sure that the purge is not allowed to SNAP into place, but is gently eased into place.
- To remove the air purge, push firmly and push directly out of the scanner. Care should be taken not to tilt the block as it is removed. A sharp tilt of the block during removal could cause it to bind in the scanner

Specifications TLAser122

- Measurement range is .003" - .85" (.075mm – 22mm)
- Resolution is .000001" (.025 μ m)
- Two-second measurement repeatability \pm .000005" (\pm .125 μ m)
- Single scan measurement repeatability \pm .0001" (\pm 2.5 μ m)
- Accuracy is .00002" \pm .01% of the maximum measurement size
- Scan Rate: 400 scans / second

Operating Environment TLAser122

- Ambient Temp. 45F-110F, relative humidity 10%-90% non-condensing
- Power requirements from PC: +12VDC 125mA, +5VDC 100mA, -5VDC 75mA
- Laser Class II visible red laser diode wavelength is 675nm
- Weight is 2.6 lbs. (1.2kg)
- Dimensions are 10"L x 1.25"W x 4"H

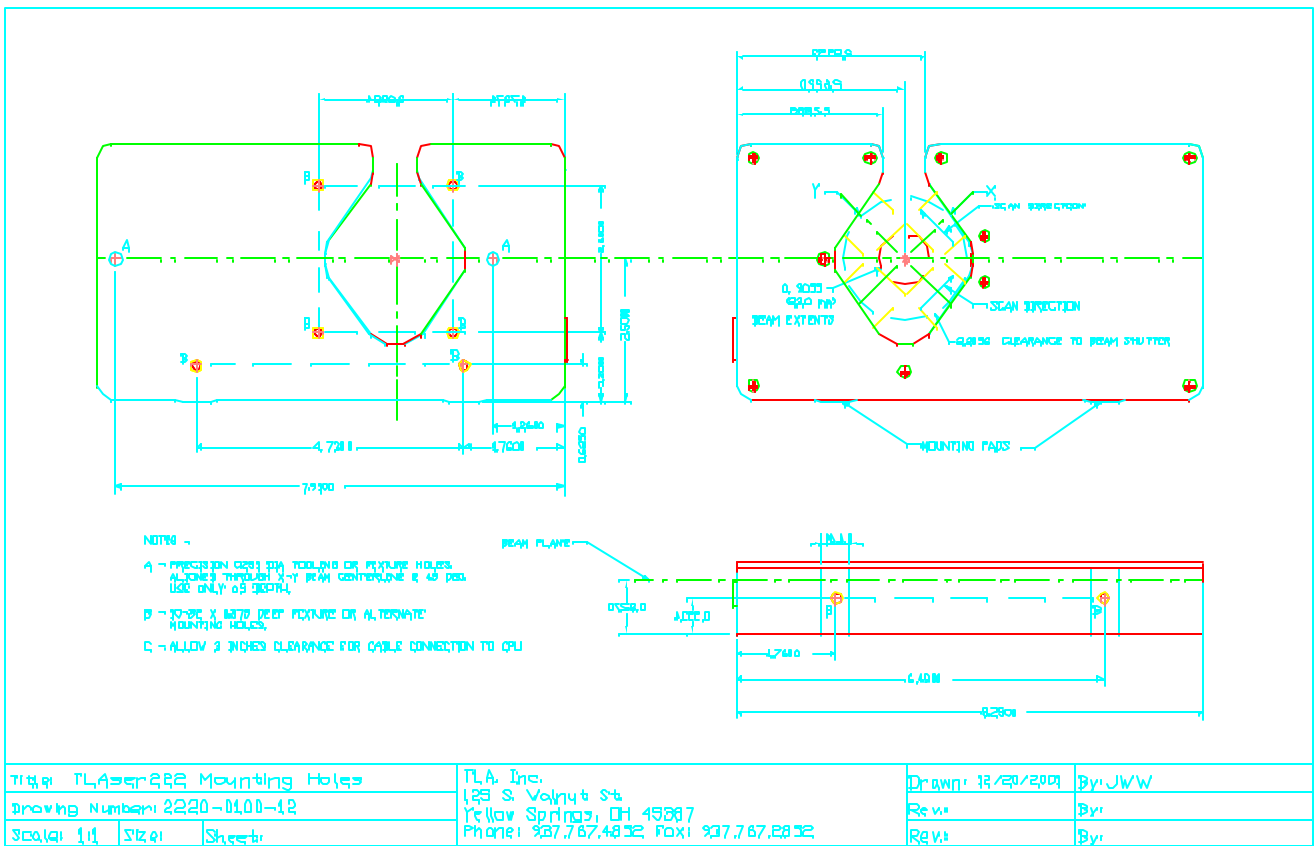
TLAser222™ Laser Micrometer

Getting Started TLAser222



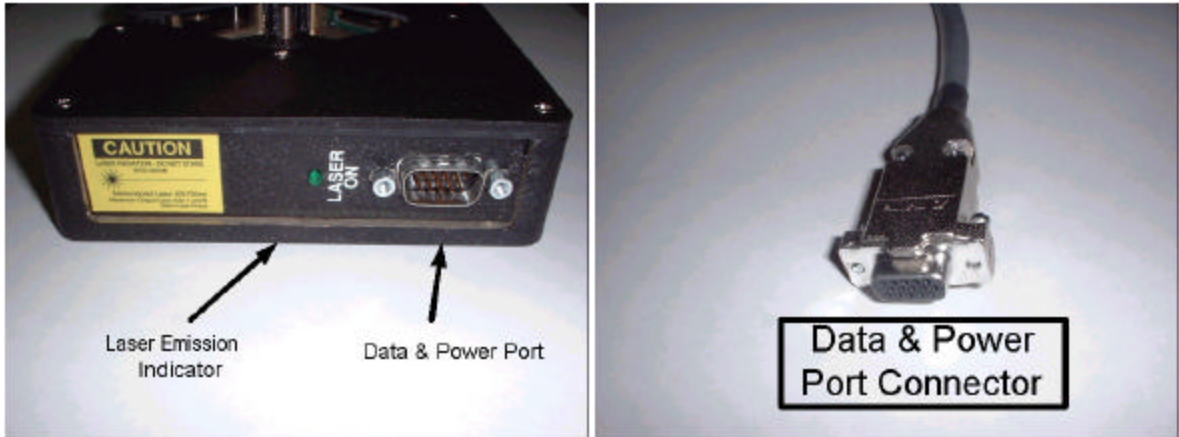
Mounting TLAser222

?? Mounting Hole Drawings – http://www.laserline.com/gauge_info/LaserLinc-TLAser222_mount.pdf



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

Connections and Cabling TLAser222



- Power and Data Port - the D-style connector is keyed and cannot be connected incorrectly. DO NOT force the cable connector into the plug as damage may occur. Check the orientation if resistance is felt. The connector, if oriented correctly, will slide snugly into the socket. Jackscrews should be connected to prevent pullout. To remove, loosen jackscrews and grasp the metal plug housing and pull directly away from the scanner.
- Laser Emission Indicator – When illuminated green, indicates that the device is active and lasers are on. Please see caution and warning labels adhered to gauge regarding handling and dangers associated with laser devices.
-

222 Air Purge



- The air purge provides a positive outward air pressure to the windows to prevent contaminants from accumulating on the windows. It is imperative that 'clean dry shop air' be used to prevent moisture and oil from collecting on the windows.

- To insert the air purge, line up the dowel pin with the circular groove under the scanner and allow it to slide gently into place. The block is held in place by magnets. Make sure that the block is not allowed to SNAP into place, but is gently eased into place.
- To remove the air purge, push firmly and push directly out of the scanner. Care should be taken not to tilt the block as it is removed. A sharp tilt of the block during removal could cause it to bind in the scanner.

Specifications TLAsEr222

- Measurement range is .003" - .85" (.075mm – 22mm)
- Resolution is .000001" (.025 μ m)
- Two-second measurement repeatability \pm .000005" (\pm .125 μ m)
- Single scan measurement repeatability \pm .0001" (\pm 2.5 μ m)
- Accuracy is .00002" \pm .01% of the maximum measurement size
- Scan Rate: 800 scans / second (400 scans / second / axis)

Operating Environment TLAsEr222

- Ambient Temp. 45F-110F, relative humidity 10% -90% non-condensing
- Power requirements from PC: +12VDC 125mA, +5VDC 100mA, -5VDC 75mA
- Laser Class II visible red laser diode wavelength is 675nm
- Weight is 2.8 lbs. (1.3kg)
- Dimensions are 8.25"L x 1.25"W x 4.5"H
- Air Purge Input; 10 – 30 PSIG, clean dry air

TLAser122s Separated Head Laser Micrometer™

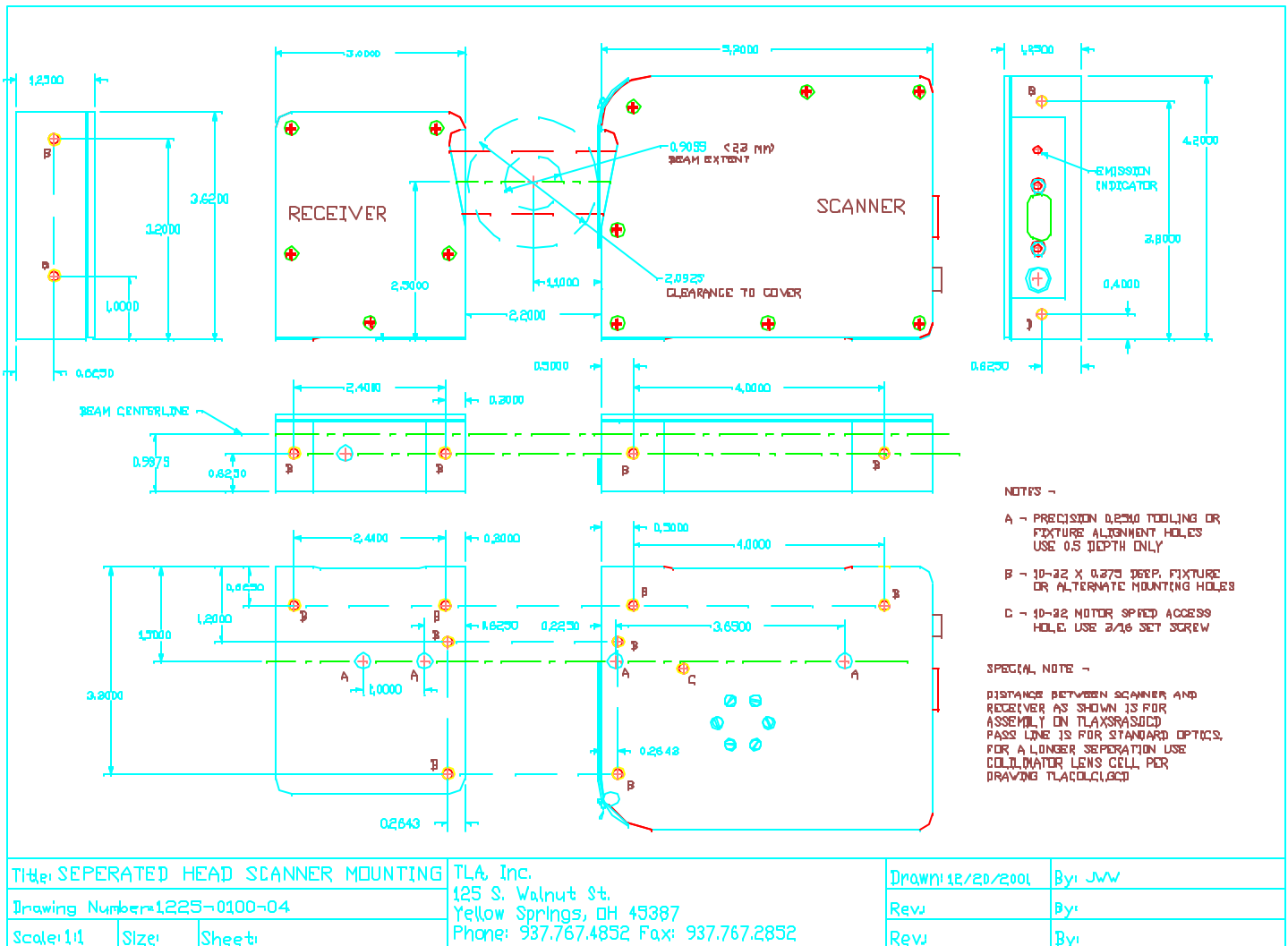
Getting Started TLAser122s



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

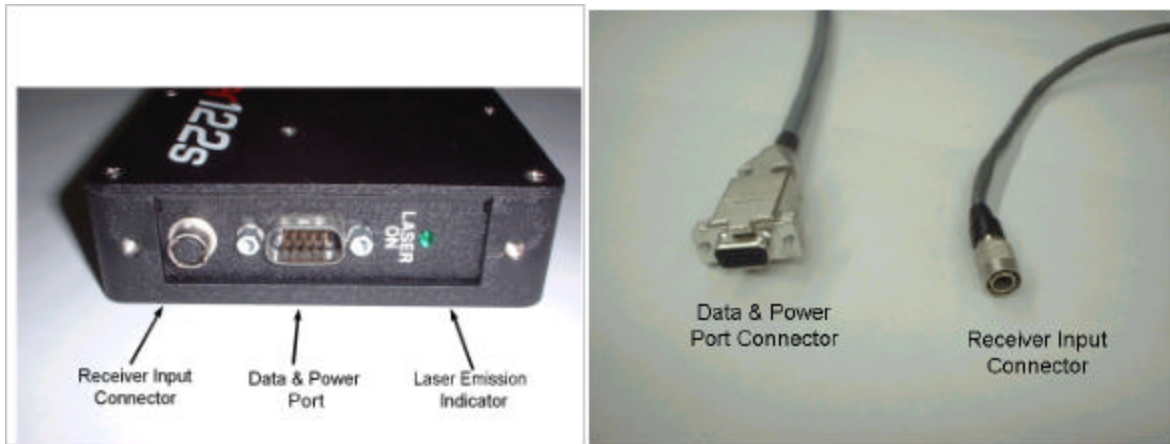
Mounting TLAser122s

- Mounting Hole Drawings – http://www.laserlinc.com/gauge_info/LaserLinc-TLAser122s_mount.pdf



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

Connections and Cabling TLAser122s



- Receiver Input Connector – The round six-position connector is keyed and cannot be connected incorrectly. To connect, gently push while rotating connector until it ‘snaps’ in. To remove, grasp connector body and pull straight back.
- Power and Data Port - the D-style connector is keyed and cannot be connected incorrectly. DO NOT force the cable connector into the plug as damage may occur. Check the orientation if resistance is felt. The connector, if oriented correctly, will slide snugly into the socket. Jackscrews should be connected to prevent pullout. To remove, loosen jackscrews, grasp the metal plug housing and pull directly away from the scanner.
- Laser Emission Indicator – When illuminated green, indicates that the device is active and lasers are on. Please see caution and warning labels adhered to gauge regarding handling and dangers associated with laser devices.
-

Specifications TLAser122s

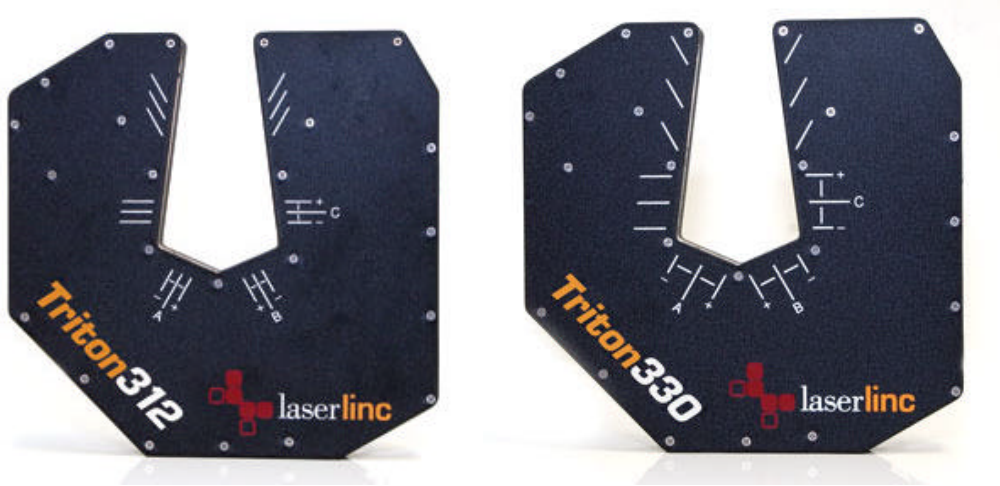
- Measurement performance specifications are subject to the separation distance between the transmitter and receiver. Desired separation distance and part placement in field must be specified for optimal performance.
- Maximum separation is 36” for .003” part, Minimum separation is 2”
- Measurement range is .003” - .85” (.075mm – 22mm)
- Resolution is .000001” (.025 μ m)
- Two-second measurement repeatability \pm .000005” (\pm .125 μ m)
- Single scan measurement repeatability \pm .0001” (\pm 2.5 μ m)
- Accuracy is .00002” \pm .01% of the maximum measurement size
- Scan Rate: 400 scans / second

Operating Environment TLAser122s

- Ambient Temp. 45F-110F, relative humidity 10% -90% non-condensing
- Power requirements from PC: +12VDC 125mA, +5VDC 100mA, -5VDC 75mA
- Laser Class II visible red laser diode wavelength is 675nm
- Weight is 2.6 lbs. (1.2kg)
- Dimensions Receiver; 3”L x 1.25”W x 3.3”H
- Dimensions Transmitter; 5.3”L x 1.25”W x 4.2”H

Triton312/330 Triple Axis Laser Micrometer™

Getting Started Triton312/330



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

Mounting Triton312/330

- http://www.laserlinc.com/gauge_info/LaserLinc-Triton312_mount.pdf
- http://www.laserlinc.com/gauge_info/LaserLinc-Triton330_mount.pdf

Specifications Triton312

- Measurement Range is .004" - .40" (.1mm – 10.16mm)
- Maximum Measurement Size – .47" (12mm)
- Resolution - .000001" (.025µm)
- Two-second measurement repeatability $\pm .000005"$ ($\pm .125\mu\text{m}$)
- Single scan measurement repeatability $\pm .0001"$ ($\pm 2.5\mu\text{m}$)
- Positional Error is $\pm .00009" \pm .2.286\mu\text{m}$ within center .4" of field
- Scan Rate: 1800 scans / second (600 scans / second / axis)

Specifications Triton330

- Measurement Range is .004" - 1" (.1mm – 25.4mm)
- Maximum Measurement Size – 1.18" (30mm)
- Resolution - .000001" (.025µm)
- Two-second measurement repeatability $\pm .000005"$ ($\pm .125\mu\text{m}$)
- Single scan measurement repeatability $\pm .0001"$ ($\pm 2.5\mu\text{m}$)
- Positional Error is $\pm .00009" \pm .2.286\mu\text{m}$ within center 1" of field
- Scan Rate: 900 scans / second (300 scans / second / axis)

Operating Environment Triton312/330

- Ambient Temp. 45F-110F, relative humidity 10% -90% non-condensing
- Power Requirements: 12VDC 200ma, +5VDC 150ma, -5VDC 150ma
- Laser Class II visible red laser diode wavelength is 675nm
- Weight: 8.5 lbs / 3.9 kg
- Dimensions: 9.75" x 10" x 1.25" / 248mm x 254mm x 32mm
- Air Purge Input; 10 – 30 PSIG, clean dry air

Preventive Maintenance & Troubleshooting

TLAserX22/3xx Cleaning and Routine Maintenance

- Cleaning – The windows of the TLAserX22/3xx must always be clean to ensure the highest measurement accuracy. To clean the windows:
 1. Remove the air purge or air purge if applicable.
 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.
 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 acetone is used, 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.
 4. Wipe each window once, from side to side. Do NOT scrub. Do not wipe from top to bottom.
 5. Use a new swab or wipe for each window.
 6. If Windex is used, 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.
 7. Replace the air purge or air purge if applicable.
 8. There are no user-serviceable parts inside scanners – removing cover will void warranty.

Troubleshooting and FAQs

- Troubleshooting
 - **Problem:** Total Vu measurement reports “Too Few: 4”
 - **Possible Causes:**
 1. There is no part in the field. Check that the part is in the field and illuminated by the laser. Check each axis, via the test port, for correct waveform.
 2. One axis is completely obstructed. Check that there is nothing obstructing either axis. Check each axis, via the test port, for correct waveform.
 - **Problem:** Total Vu measurement reports “Too Few: 6”
 - **Possible Cause:**
 1. The part is in the field in one axis, but not the other. Check each axis, via the test port, for correct waveform.
 - **Problem:** Total Vu measurement reports “Too Few: 0”
 - **Possible Causes:**
 1. The laser field is obstructed. Check that the air purge is completely inserted into the scanner. Check each axis, via the test port, for correct waveform.
 - **Problem:** Total Vu measurement reports “Too Many: (any number > 8)”
 - **Possible Causes:**
 1. There is dirt on a window. Remove the air purge and inspect for spots, dots, or glowing flecks on any of the windows. Follow the window cleaning procedure described earlier in this document. Check each axis, via the test port, for correct waveform.
 2. There is more than one part in the field. Check for lint attached to the air purge. Check for any additional fibers in the scan field. Check each axis, via the test port, for correct waveform.
 - **Problem:** Total Vu measurement reports “No Scan”
 - **Possible Causes:**
 1. The scanner is not powered. 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).
 2. The scanner data cable is not connected. 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:**
 1. Please contact LaserLinc for further help.

TLAser400™ PCI Micrometer Interface Card

Getting Started



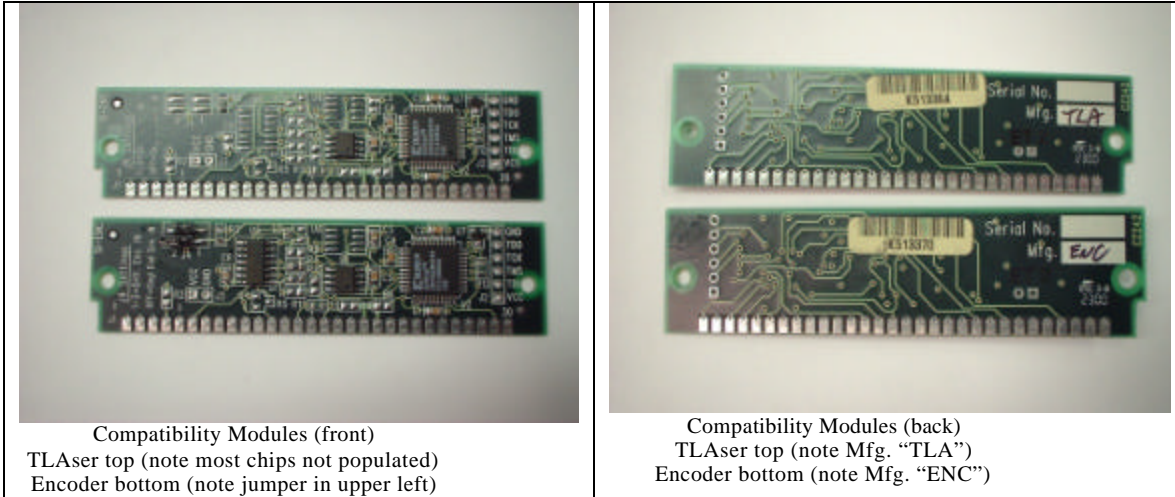
TLAser400 PCI (no modules installed)

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

Hardware Installation

- Turn off the target PC.
- Remove the cover to gain access to the back plane.
- Find an open PCI slot. PCI slots generally have white/cream colored connectors. ISA slots generally have dark brown or black connectors.
- Remove the back panel slot cover.
- Insert the card into the slot. Make sure that the card edge connector is aligned with the back plane connector.
- Press firmly. You should feel the card snap into place.
- Use the screw that was originally holding the back panel slot cover in place to secure the TLAser400 PCI in its slot.
- Replace the PC cover
- Power the PC.
- Refer to software installation section for further installation instructions.

Compatibility Modules



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. 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 on the PC should be sufficient to keep the TLAser400 interface card sufficiently clean.

Operation Environment

- Operating temperature: 45F – 110F
- Storage Temp: 0°F - 150°F
- Humidity: 10% to 90% relative, non-condensing

Specifications

- Number of channels: 4
- Interface: PCI 2.1 or 2.2
- Resolution: 0.1ns, based upon event average
Single event resolution is 2ns
Resultant measurement accuracy is dependent upon the individual micrometer
- Measurement rate: over 50,000 measurements/second