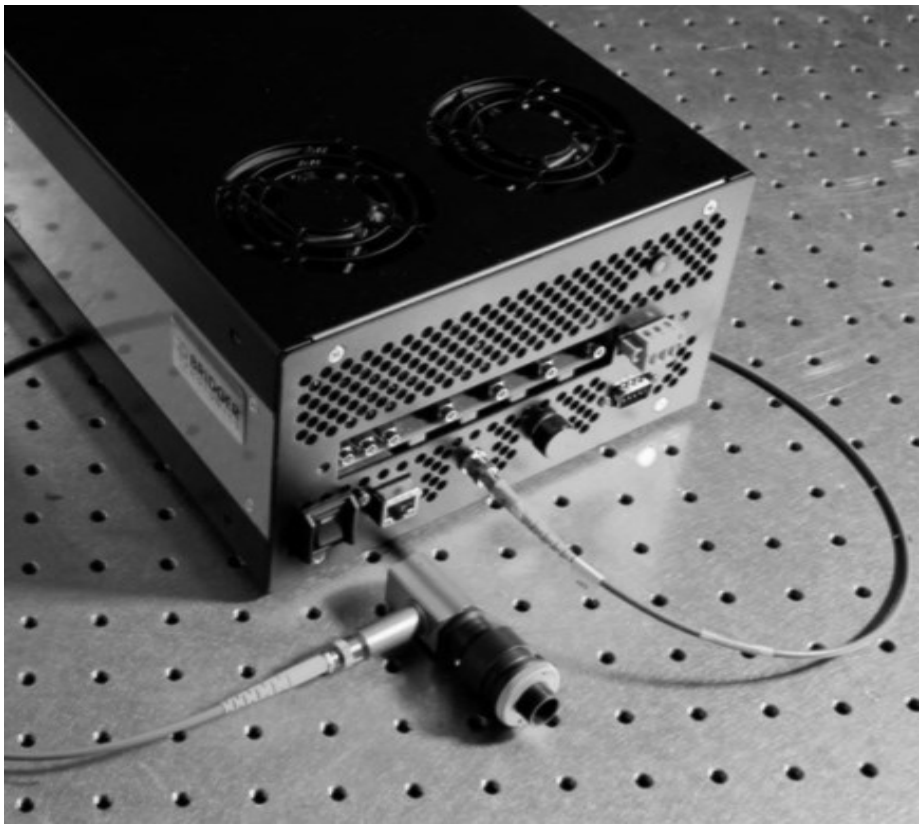
SLM IM

Industrial Distance Metrology System

Product Features

- 1 kHz measurement rate
- <2 ms measurement latency
- 0-2 m range window
- <10 µm accuracy
- Fiber optic beam delivery with compact probe
- GUI/API measurement control and interface
- Ethernet communication

The SLM-IM industrial metrology system provides rapid and accurate distance measurements for precision manufacturing and material processing applications. It features a compact and rugged form factor, a powerful and user-friendly software interface, and conveniet fiber delivery of the measurement beam via a compact optical probe. The flexible beam delivery, low measurement latency, and user-configurable API interface facilitate OEM integration into laser material processing and multi-axis traditional machining platforms for enhanced manufacturing capabilities including: in-situ dimensional verification and quality control measurements, 3D mapping of the part as it is fabricated, and real-time feedback for improved control of the manufacturing process.

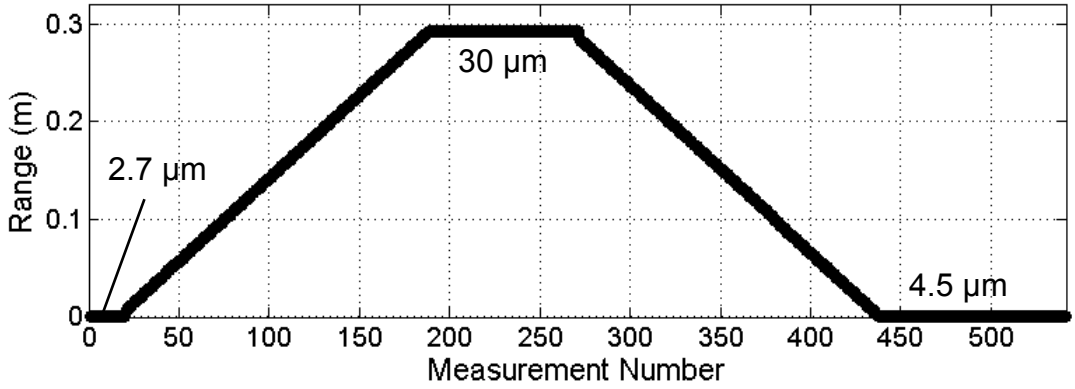


BRIDGER PHOTONICS

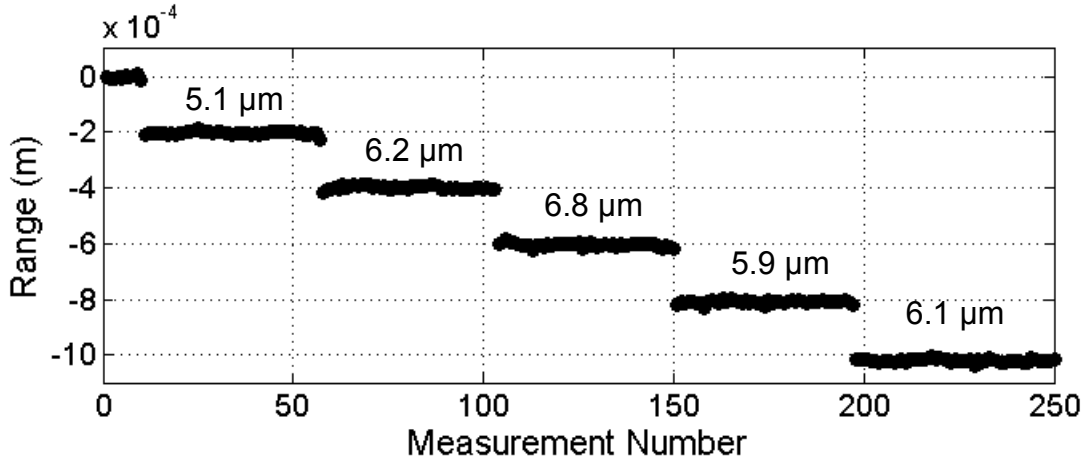
(406)-585-2774
www.bridgerphotonics.com

2310 University Way
Bldg. 4-4
Bozeman, MT 59715

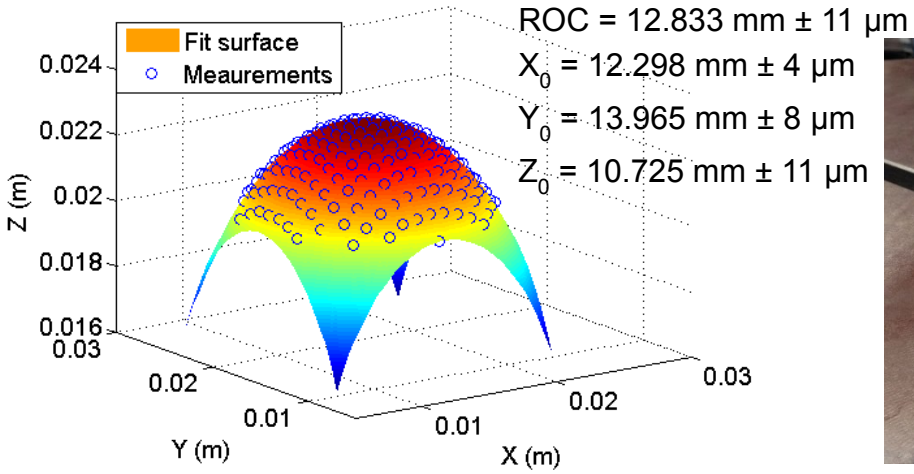
Axial motion testing – A brushed aluminum part is moved along the beam axis away from, and toward the probe at 100 mm/s.



Lateral motion testing -120 mm/s velocity on a machined aluminum part with 200 µm steps at a range of 1.5 m.



3D mapping – High accuracy mapping is achieved by scanning the measurement beam over a part under test.



TMS Series

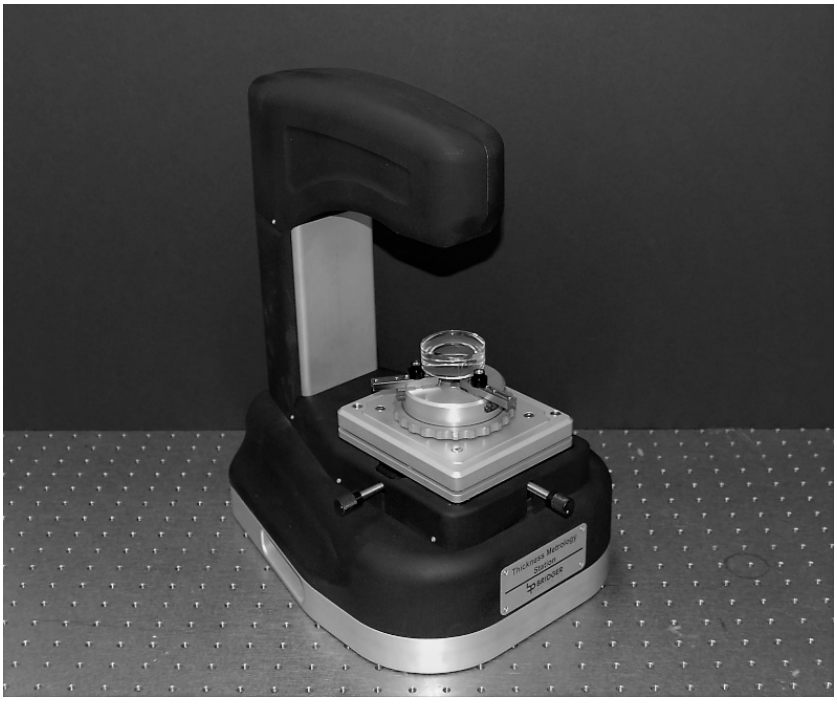
Thickness Metrology Station

Product Features

- Non-contact thickness metrology to save scrap and rework
- Provides physical thickness, optical thickness
- Provides group index to identify material and eliminate mix-ups
- Measures thicknesses up to 75 mm (optical) without adjustments
- Achieves <500 nm precision and accuracy on polished optics
- Accommodates up 8” diameter optics
- Enables standardized, repeatable measurements regardless of the user
- Automated specification pdfs

The last place an optics manufacturer wants to contact an optic is usually in the very center. But that’s precisely what optics manufacturers are currently forced to do because no non-contact physical thickness metrology option exists. The result can be scrapped or reworked parts, tedious and mistake-prone manual measurements that are transcribed by hand, and insufficient accuracy to meet the increasing demands of today’s premium optics customers.

To fill this technology gap, Bridger Photonics’ Thickness Metrology Station provides the only non-contact thickness measurement solution capable of measuring up to 75 mm optical thickness with accuracy better than 500 nm. The system automatically performs three measurements: physical thickness, optical thickness, and group refractive index. The index information can be used to identify the optical material, and thereby eliminate the chance of sending the wrong material to your customers.



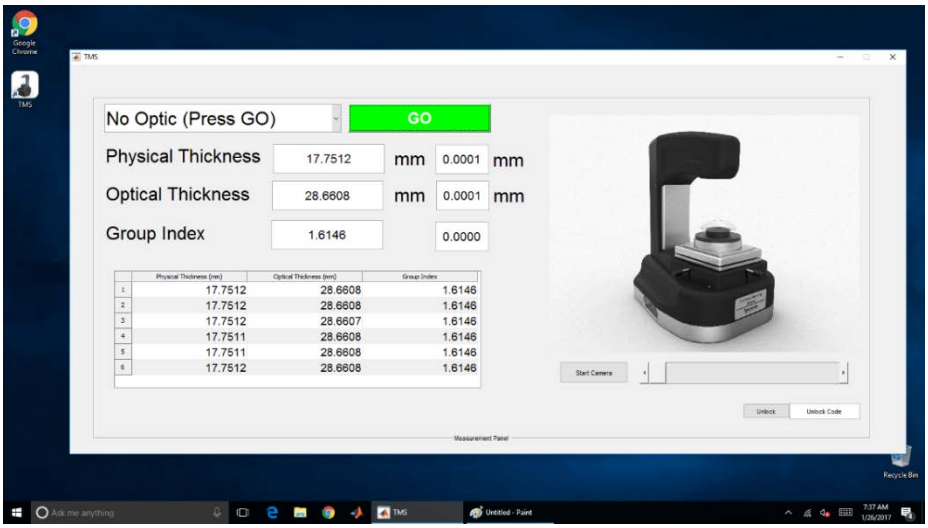
BRIDGER PHOTONICS

406-585-2774
www.bridgerphotonics.com

2310 University Way
Building 4-4
Bozeman, MT 59715

Repeatable Measurements and Simple Report Generation

Consistent and simple optics mounting enables repeatable, standardized measurements regardless of the users. Mounting options include: self-centering 3-jaw chuck, annular derlin rings or just a base platform. The measurements are automatically displayed on a provided touch screen computer interface and prepared customer reports if desired.



Product Options

The Thickness Metrology Station comes with the TMS optical head, TMS base unit and touch screen computer. The standard annular derlin rings are included for easy optics mounting.

Talk to us about customizing your Thickness Metrology Station with:

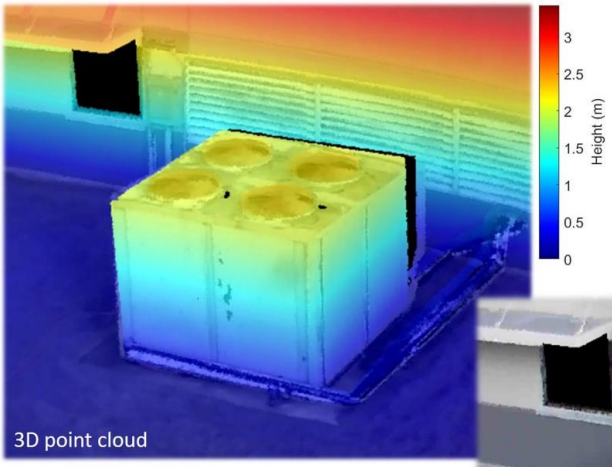
- Self-centering 3-jaw chuck or custom mounting options
- SAG measurement capabilities
- Custom report generation and ERP integration
- Thin optics and high accuracy options

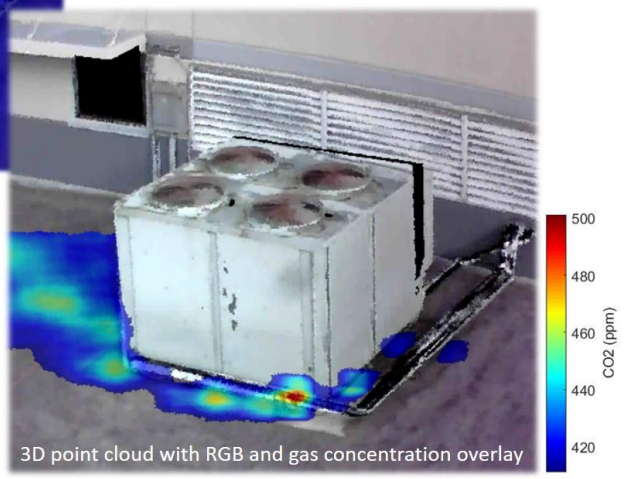
Gas Mapping LiDAR™

Product Features

- 3D terrain imaging overlaid with gas concentration map
- Geo-registered image data
- Target gas species: CH_4, CO_2 (other species available upon request)
- 5 ppm-m CH_4 minimum detection sensitivity (50 ppm-m typical, depends on target)
- Range: 50 m UAV, 330 m manned aircraft
- Range Resolution: 1 cm UAV, 5 cm manned aircraft
- 10 kpps measurement rate
- SW&P: UAV (5500 cm^3, 2 kg, 60 W), Manned aircraft (50,000 cm^3, 10 kg, 150 W)

Bridger Photonics' Gas Mapping LiDAR is the ideal tool for applications such as pipeline leak detection, extraction and processing facility monitoring, and landfill emissions monitoring. The sensor combines spatially-scanned laser ranging with gas absorption measurements to provide overlaid 3D topographic and gas concentration imagery. The simultaneous range and absorption measurements enable high-precision determination of the gas concentration along the measurement path to both detect *and* pinpoint gas leaks. Specialized measurement routines and data processing algorithms provide quantitative leak rate estimates for detected leaks. Flexible features and interface enable large-area leak monitoring from both fixed-positions and vehicle platforms. The sensor's compact form factor, integrated GPS/IMU sensors, and wireless communication capability allow for operation from a variety of vehicle platforms including UAV.





BRIDGER PHOTONICS

(406)-585-2774
www.bridgerphotonics.com

2310 University Way
Bldg. 4-4
Bozeman, MT 59715

Figure 1. Gas Mapping LiDAR applications and concept of operations. (Left/Center) Short range applications such as automated facility monitoring from fixed position or UAV-mounted sensors. (Right) Long range applications such as pipeline and associated infrastructure monitoring from a manned aerial vehicle.

Applications

Bridger's Gas Mapping LiDAR utilizes topographic targets to backscatter received laser signals. The backscattered signals enable very high precision gas concentration measurements, and therefore, high sensitivity leak detection. As such, Gas Mapping LiDAR is well-suited for downward-looking measurement scenarios. Example applications include:

- Automated facility scanning from a fixed position mast – *Figure 1: Left*
- Automated facility scanning from UAV platforms - *Figure 1: Center*
- Transmission pipeline monitoring from manned aerial vehicles - *Figure 1: Right*

Data Product

Figure 2 provides example Gas Mapping LiDAR data captured with Bridger's prototype CO_2 sensor mounted on a 10 m mast. The data consists of spatially-registered 3D topography and CO_2 concentration images. A pipeline located 6' below the ground surface leaks CO_2 from two locations at a rate of 54 kilograms per day. The concentration map shows the CO_2 from the two pipeline leaks emanating from the ground surface.

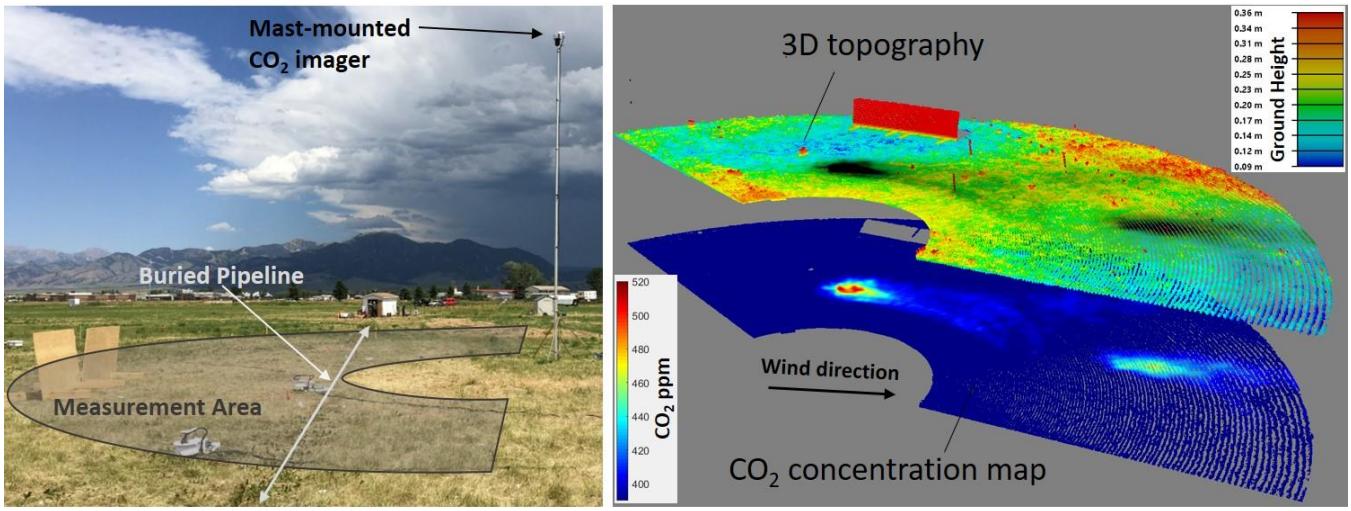


Figure 2. Buried pipeline CO_2 leak detection scenario.

Development timeline

Bridger has completed development of beta unit sensors for CO_2 and CH_4. Initial sensor flight testing is scheduled for Spring 2017. Detection of other gas species is possible and can be integrated upon request.