# E8717A LIDAR Target Simulator

Target distance, reflectivity with full field-of-view

Accelerating Deployment with Minimal Space

The Keysight E8717A Lidar Target Simulator provides simulated targets in distance with reflectivity and a host of proven features focused on providing valuable insights into lidar sensors. At one time, corner reflectors were used for radars and slowly being replaced by radar target simulators. The time is now for a lidar target simulator to address in-place of target boards and real-world objects for test.


![KEYSIGHT]
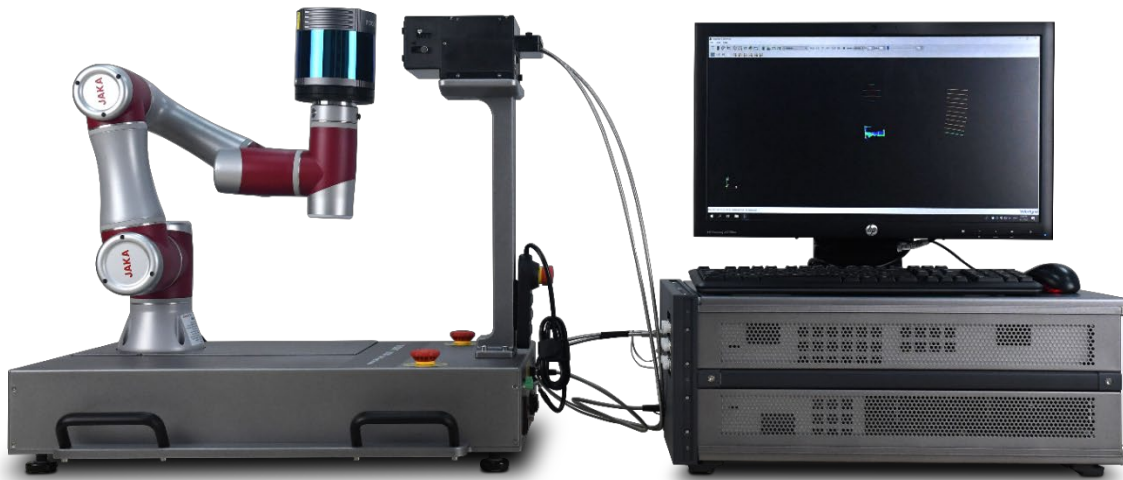
Optimize Your Test Space Through Target Simulation

Utilizing target boards require large floor space for lidar range test. Consider these simple test setups (Figure 1 and 2), one done outdoors to achieve a longer target distance, and another done indoors. As lidar demand reaches a critical point, manufacturing automation, and space optimization will become imperatives.
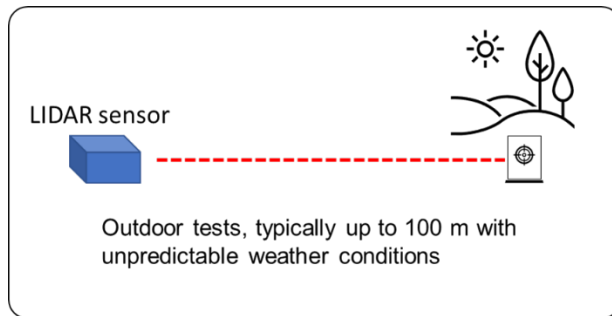
**Figure 2.** Outdoor with target boards, typically > 100 m
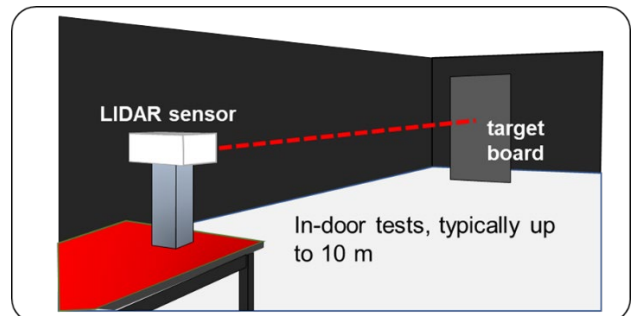
Figure 3. Indoor with targets boards, typically ~ 10 m

With a LIDAR Target Simulator (LTS), target distances would be adjustable with a click of a button. This would also include simulating a wide range of reflectivity with additional features to provide valuable insights into the lidar sensors. And the setup should be kept compact, preferably a bench type setup, keeping the usage of space at a minimal while maximizing on the test coverage. Keysight is applying years of expertise in photonics and target simulation to introduce such an LTS for the future of lidar test needs.

At the heart of Keysight E8717A LIDAR target simulator is the LTS base unit (Figure 4), receiving the lidar sensor signal via the remote optical head. The base unit adds delay and attenuation to simulate desired target distance and reflectivity respectively and returns the signal back to the sensor.

A cobot (Figure 4) is used to position the LIDAR sensor to cover the desired field-of-view (FOV) to be received by the stationary remote optical head. This combination and the unique remote optical head design makes it compatible to all time-of-flight lidar sensors, be it solid state or mechanical rotating.
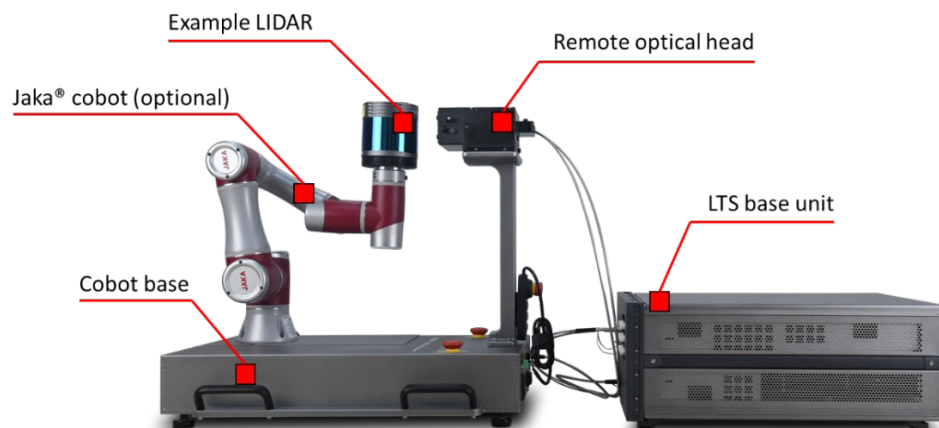
Figure 4. Keysight E8717A LIDAR Target Simulator with Jaka® cobot

Visualize and Analyze LIDAR Data

Accelerate your deployment and reduce time on developing and maintaining software to visualize and analyze your lidar sensors. Take a deep dive into the lidar's performance with the following innovative software available with the LTS:

- PathWave LIDAR Visualization Engine
  - PCAP recording and playback
  - Visualization of PCAP
- PathWave LIDAR Analytics
  - Statistical analysis: Distance sweep and Reflectivity sweep
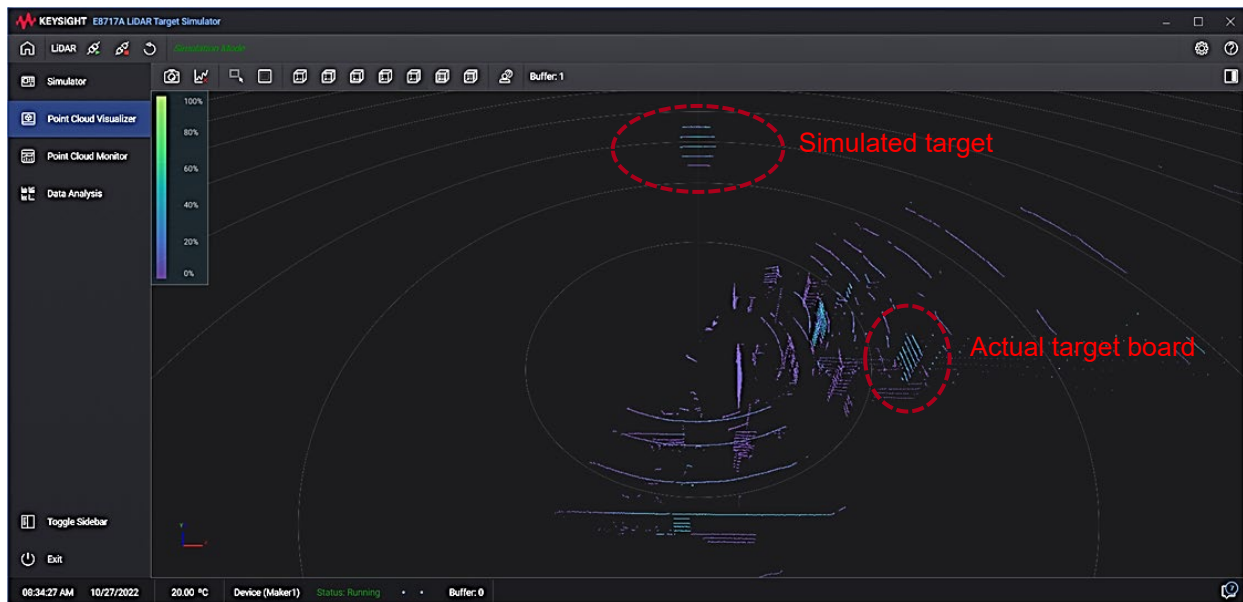 - Point cloud analysis: Probability of Detection, Histogram, Box plot, Frame level analysis

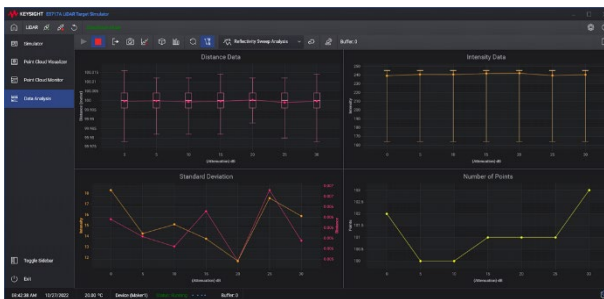**Figure 5.** Point cloud visualizer – with simulated target and actual target board

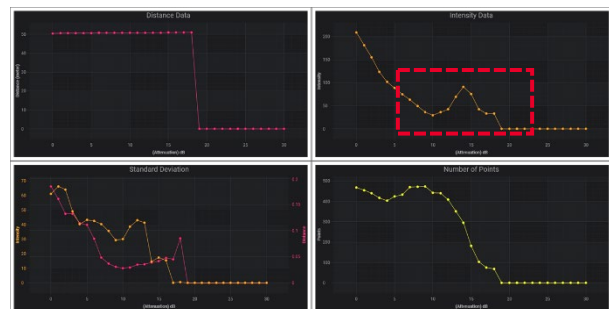**Figure 6.** Reflectivity sweep data summary

Figure 7. Identify abnormal behaviors from intensity sweep e.g., top right panel indicates abnormality when sweeping from 100% to 0% intensity

Specifications and Features

Test and functionality

Wavelength [1]	905 nm
Distance simulation / Step	3 m to 300 m / 1m
Distance accuracy	5 cm
Distance sweep	3 m to 300 m in 1m step
Reflectivity simulation	10% to 94% [2] [3]
Reflectivity sweep	10% to 94% (step size dependent on lidar)
Attenuation range / step	0 - 30 dB / 0.25 dB minimum step size
Field of view (realtime)	Lidar dependent
Field of view (with cobot)	± 35 deg (vertical / elevation) 360 deg (horizontal / azimuth)
Supported DUT Lens configuration	Dual and single lens
Physical and electrical specifications	
Base system dimension (L x W x H)	600mm x 222mm x 431mm
Cobot assembly base and optical remote head dimension (L x W x H)	680mm x 550mm x 616mm
Base system weight	22 kg
Cobot assembly base and optical remote head weight	53 kg
Physical and electrical specifications	
Base system	100-240V with 50/60Hz, 500VA Max
Cobot assembly	100-240V with 50/60Hz, 1000VA Max
Cobot specifications (optional)	
Supported lidar Size (L x W x H)	165mm x 165mm x 140mm
Payload Weight	Max. 3.0 kg including lidar fixture [4]

1. For other wavelengths e.g., 850 nm and 1550 nm, please contact Keysight
2. Results of reflectivity simulation between sensors may differ, the above was referenced from Velodyne® VLP-16 and Valeo® Scala2
3. Low reflectivity simulation from 5% - 10% is possible, and requires DUT performance data with real target board
4. For heavier load, please contact Keysight

Optimize Cost of Test

Keysight LTS creates a new paradigm, re-imagining how lidar tests can be performed, not bounded by large spaces or real-world environments. All the advance features are available within a small footprint suitable for both manufacturing and R&D test setup.

As the lidar market continues its trajectory, this test revolution is on the horizon to meet future demands. Time-to-market is crucial in this competitive industry, every advantage provides the competitive and differentiated edge in your lidar solution.

- Save on floor space and handling time while maintaining test coverage
- Support all types of time-of-flight lidars
- 3D / real world object simulation
- Cobot based automation for fast, accurate and repeatable testing
- Test automation and analytics ready to achieve higher yields with meaningful data

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