FLUKE®

101 applications for laser distance meters

Application Note

What would you do, if you had a laser distance meter to measure distance, instead of a regular measuring tape or wheel?

The Fluke 421D, 416D and 411D laser distance meters measure distance to a target up to 100 m (330 ft) away using the unit's laser spot, and can do a quick calculation of area (square feet/meters) and volume. Accuracy is up to 1.5 mm (1/16 in).

Fluke asked users for ideas on how to use a laser distance meter, and got back quite a few. We've collected 101 of the best.

Facilities: Layout

1. Provide accurate estimates for bidding out work (HVAC, electrical, cable, maintenance). Measure distances, area, and/or volume.
2. Measure height or width of buildings[1] and other objects, by triangulation if needed.
3. Verify CAD drawings for as-builts and design drawings.
4. Determine how square a room or object really is, or whether the sides are completely parallel.
5. Lay out parking lots.
6. Verify that new construction satisfies usage requirements.
7. Determine footprint of equipment or office cubicles to be installed, to aid in layout.
8. Create as-built building dimensions where no blueprints are provided.
9. Calculate total internal floor space/volume of a room or building.
10. Measure distances over areas where obstacles in the way disallow the use of measuring tapes or wheels.

Automatically calculate square footage.

Measuring long distances.

Incremental measurements using the stakeout feature (421D only).

Facilities: Cranes

11. Measure distances on roof[1] to quote on crane lift needed for rooftop equipment replacement.
12. Measure ceiling height to determine equipment needed for access.
13. Quickly calculate length of wire rope needed for cranes.
14. Set up collision detection for cranes without pulling tape and using two people and two aerial lifts.
15. Measure spans on runways for cranes.

[1] Laser measurement outdoors can be compromised by direct sunlight.

Facilities: Safety

16. Measure distances (including ceiling heights) to install emergency lighting, sprinklers, and fire extinguishers to code.
17. Determine accurate room dimensions to ensure correct chemical concentration for Clean Agent Fire Suppression system.
18. Measure distances from machines for safety equipment (fire extinguishers, fire blankets, etc.).
19. Measure water levels in fire suppression tanks.

Facilities: Other

20. Use in setting up floor supports in large communication rooms.
21. Measure room dimensions to calculate how much paint is needed.
22. Measure room dimensions to calculate how much floor covering is needed.
23. Measure height for appropriate ladder selection.
24. Document location of standing water or leaks found with a thermal (IR) imager or infrared thermometer.

Electrical: Cable

25. Measure distances for linear length of wire or cable runs.
26. Measure distances for linear feet/meters of conduit needed for new installations.
27. Measure height of high voltage lines to meet clearance requirements.
28. Calculate total length needed in setting up wire assemblies and harnesses.
29. Measure distances to calculate voltage drops (in power supply).
30. Measure depth, distance of underground conduit.[1]
31. Determine length of wire available on hand.
32. Measure distances of underground cable[1] from various landmarks or obstacles/known hazards.
33. When locating underground cable with a transmitter/sensor tool combo, trace down cable and shoot back with distance meter.[1]
34. Locate underground cable faults[1] using the A-frame method. Tell the exact distance of fault from starting point without tape measure or trundle wheel.

Electrical: Ceiling/Floor

35. Measure distances to objects within hard-to-reach drop ceilings to determine overhead cable runs, line of sight.
36. Measure ceiling height and square feet/meters to determine rod lengths for drop ceiling installation and lighting fixtures.
37. Measure distance under subfloors or structures for networking or other cable installations.

Electrical: Safety

38. Measure distances from power system devices (transformers, etc.) for electrical safety/arc flash protection and power studies.

Electrical: Other

39. Measure disconnect placement for spas and pools.
40. Measure distances between electrical service poles.
41. Ascertain distance around walls for proper receptacle placement per code.
42. Decide where to place power drops/connections to the power supply in manufacturing floor layouts.
43. Measure electrical room square feet/meters for regulation verification.

Industrial Maintenance: Conveyors

44. Determine conveyor belt length (for/at installation).
45. Calculate conveyor belt capacity, based on length.

Industrial Maintenance: Layout

46. Measure distance between machines to estimate heat loading.
47. Determine equipment ventilation requirements (mass air flow).

Industrial Maintenance: Tanks

48. Check tank level[2] and verify accuracy of tank level transmitters.
49. Measure water level at power plant water intake.

Industrial Maintenance: Other

50. Check calibration of automated product shuttle distance sensors.
51. Align large welding fixtures.
52. Determine the volume of industrial ovens used in powder coating, etc.

Measuring height to tall ceiling.

[1] Laser measurement outdoors can be compromised by direct sunlight.
[2] Do not use laser measurement tools in the proximity of flammable materials.

Calculating equipment footprint.

HVAC

53. Measure roof height[1] to determine flue lengths.
54. Calculate duct lengths for static pressure drop on long runs.
55. Determine rise or drop over distance, for pipe drainage.
56. Measure distances for duct runs for installation or replacement.
57. Determine room volume for cooling, air flow/ exchange requirements, sizing equipments.
58. Determine duct run type (size, for volume requirements).
59. Size ducts for traversals.
60. Measure distances for air handler spacing.

Plumbing

61. Determine distance between pumps and distance the pump needs to push liquid, to determine pump and/or motor size.
62. Determine distance for pump lines and piping runs, especially when measuring pipe lengths behind existing walls.
63. Measure distances between tower drives for water pressure calculations in irrigation.
64. Measure the size of a yard to figure out sprinkler heads required.
65. Measure condensation lines for installation/repair.

Construction

66. Find horizontal lengths (overhead) for determining rain gutter[1] length.
67. Measure distances from roads[1] and property lines to comply with local building codes.
68. Determine amounts of structural materials (studs, plywood) needed for construction.
69. Determine insulation requirements (volume needed).
70. Determine offsets needed for septic systems.[1]
71. Determine trench, hole depth.[1]
72. Determine amount of sheetrock to cover surfaces.

Lighting

73. Find center point of ceiling and other key locations for fan/lighting installation.
74. Determine light/lumen requirements based on ceiling height, compared to elevations of suspended lighting fixtures.
75. Determine the number of power supplies needed in temporary LED lighting applications.
76. Determine distance from power supplies for LED and low-voltage lighting and other electronic loads.
77. Determine length to access light fixtures in high ceilings for maintenance.

IT

78. Determine network equipment spacing in communication rooms.
79. Measure reach and distance between wireless network elements for IT installation technicians.

Towers

80. Estimate guy-cable lengths for cell towers.[1]
81. Set earth grounds for cell tower; measure distance from ground when conducting earth-ground 3-pole fall of potential tests and soil resistivity tests.[1]
82. Determine safe distance from microwave transmitters on cell towers.[1]
83. Measure height of equipment on utility poles in surveying for cell tower sites.[1]
84. Measure heights of lines and brackets on transmission towers for maintenance.[1]

Solar

85. Measure roof width and peak height[1] to calculate roof pitch in estimating output of solar panels.
86. Determine roof area[1] for solar panel size estimates.
87. Document location of shading analysis[1] for ground-mounted PV (photo voltaic) array.

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Automotive

88. Calibrate on-board distance, parking, and warning systems.
89. Set up a stopping distance course for training/demonstration and brake tests.
90. Check for vehicle oversize load clearances.

Video, audio, and theatre

91. Measure distances for camera lens selection, focus and zoom settings.
92. Figure length for video and camera cable compensation calculations.
93. Measure height of video projector and screen for calculation of lumens and for pixel per inch/quality of projection.
94. When evaluating a room or new system design, calculate viewing angles, and audio-based predicted coverage maps.
95. Measure the height of a lighting pipe to raise theatrical lighting trusses to specific heights above the stage or the seats.

Biomed

96. Verify source-to-image distances when servicing X-ray equipment.
97. Verify discrete medical equipment distance requirements are met when systems are installed.

Other

98. Check distance from objects for setting thermal imager ranges and determining distance to spot accuracy on infrared thermometers.
99. Determine distance between surveillance cameras and subjects to get desired coverage.
100. Measure from a target to the optical micrometer mounted on an alignment telescope for setups in a calibration lab.
101. Continuously measure automated moving equipment to verify correct location.

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