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LDT5 LDT5S

ELECTRONIC LASER DIGITAL THEODOLITE



LASER RADIATION
DO NOT STARE INTO BEAM
CLASS II LASER PRODUCT

A complete and effective integration of advanced laser technology with an innovative optics and electronics system

The compact LDT5 instruments combine a 5-second electronic digital theodolite with a laser module for easy set up in restricted space and improved portability. The water-resistant body* allows the instruments to be used anywhere under the most challenging conditions, including a humid tunnel shield. LDT5 instruments provide the total solution for applications that require precise setting out and efficient positioning operation, from civil engineering projects such as mining, tunnelling, setting out, pipe laying and bridge construction to ship building and the setting of large-scale components.

* Conforms to Japanese Industrial Standard, Class IPX2 (JIS, Publ. C0920-1982). This complies with International Electrotechnical Commission Standard, Class IPX2 (IEC Standard Publ. 529-1976)



Coaxial optics

Coaxial telescope and laser optics provide a single line of sight for optimum observation and measurement. Simply sight the target and adjust the focus to bring the beam to its smallest diameter. Laser beam adjusting screws provide the operator with complete control over the laser axis.

The advanced optical design provides unmatched brightness which is especially helpful for measuring under poor lighting conditions. The built-in reticle illumination is continuously variable.

Diameter of laser beam spot (during daytime observation)

| Distance | 5m | 10m | 20m | 50m | 100m | 200m | 300m |
|----------|---------------------|-------------------|---------------------|---------------------|-------------------|--------------------|--------------------|
| Diameter | 0.5mm \varnothing | 1mm \varnothing | 1.5mm \varnothing | 3.5mm \varnothing | 7mm \varnothing | 13mm \varnothing | 20mm \varnothing |

Innovative optical system (patent pending)

The optical system features beam splitter and special porro prism for improved sharpness of the laser beam and incorporates an innovative improvement in the brightness and resolution of the telescope.

Conventional laser theodolites, which utilize the core part of the objective lens for laser emission and the periphery for sighting, place limitations on both the laser emission power and the sighting capability (Illustration 1).

A special prism, called a beam splitter, has been developed to reflect only the beam from the laser tube and to pass through the natural light directly to the eyepiece (Illustration 2).

This bold innovation allows the full area of the objective lens to be used for both laser emission and sighting.

This system prevents interference between the laser beam and natural light, thus providing a sharp laser beam and the brightness and resolution of a general theodolite.

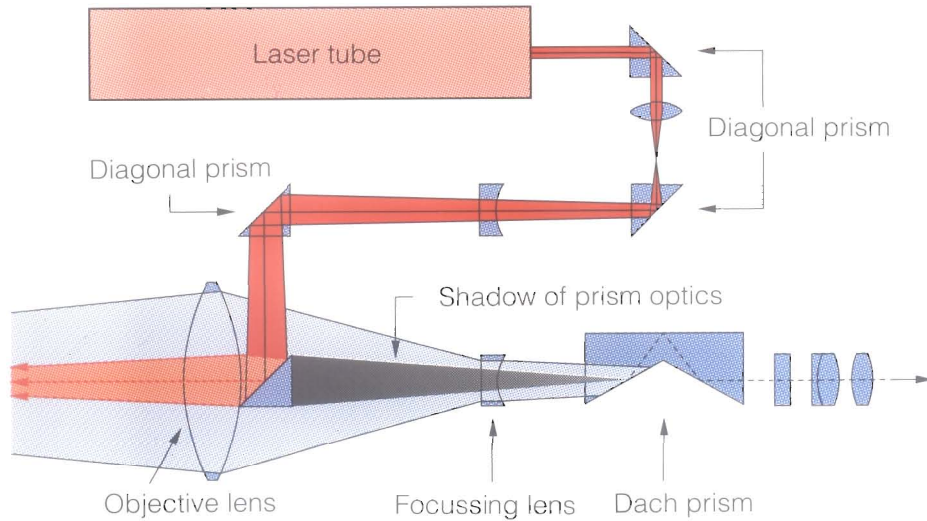


Illustration 1

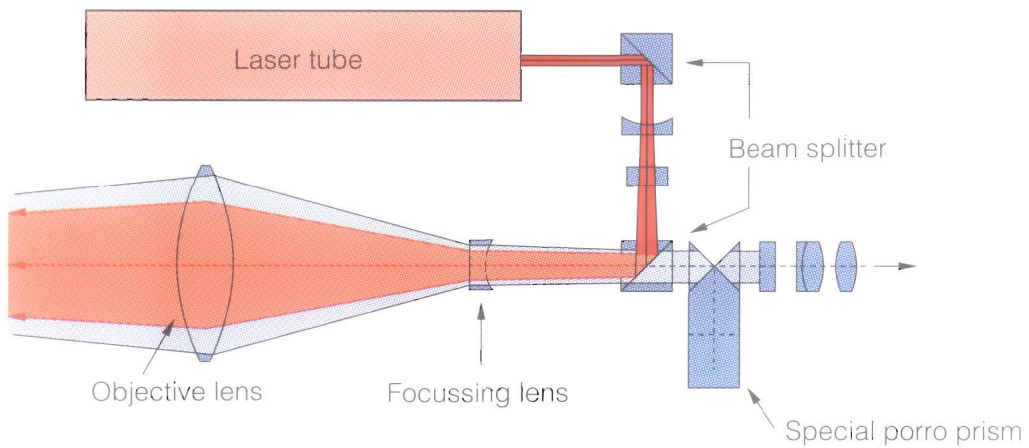


Illustration 2



Optional Laser Adaptor LCA2

When mounted on the objective lens, the adaptor modulates the laser beam into a cross-hair appearance, allowing the operator to more accurately center the beam on the target. The cross-hairs may be rotated as needed.



Laser Beam Shutter

With laser emission power kept to less than 1mW, LDT5 instruments are extremely safe Class II laser products* to operate. They also incorporate a beam shutter that quickly shuts off the beam in one action. When the beam is not needed, an LDT5 instrument can be operated as a conventional electronic digital theodolite.

* According to United States Government Code to Federal Regulations CFR21



Illuminated Large LCD Display

Two-line LCD indicates vertical and horizontal angles to 5". Built-in illumination function for reticle and display ensures clear readings, even under poor lighting conditions. A sliding key cover prevents accidental key operation.

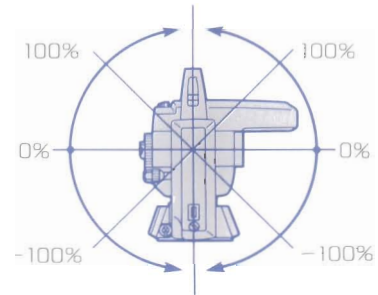


Shifting Base-type Instruments (LDT5S)

The levelled instrument can be slid directly over the surveying point within $\pm 8\text{mm}$. When used in combination with an optical plummet, centering can be completed quickly and easily. The LDT5 comes equipped with a removable tribrach.

Complete Range of Measurement Modes

Simple key operation allows selection of measurement mode, and the percentage of slope can be displayed (maximum range: $-290\% \sim +999.909\%$ on face left). Zenith angle, vertical angle (horizontal: 0) and height angle (horizontal: $\pm 90^\circ$) can be selected by internal switch. The horizontal circle can be freely set to "0" or held to a specific value. Horizontal angle reading can be selected clockwise or counterclockwise.



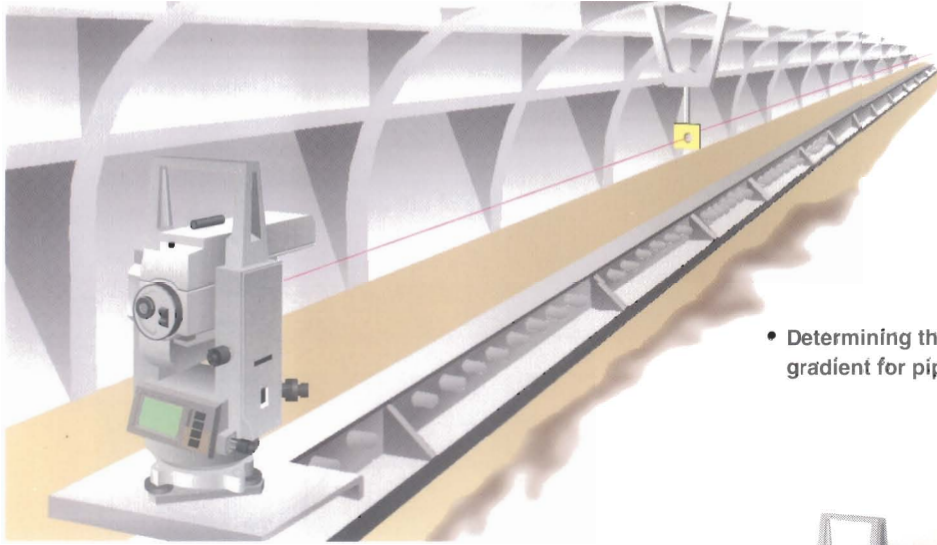
Wide Selection of Power Supplies

Standard AC/DC converter EDC20 is provided with each LDT5 instrument to support 92 ~ 132V AC power (EDC20A: 180 ~ 260V AC). Optional BDC7 rechargeable battery can supply power for approximately 3.5 hours (50 hours when only operating the instrument as a theodolite). Both EDC20/20A and BDC7 are attachable to the tripod. An external power input plug is located in the base, allowing the instrument to be freely rotated without cable interference.

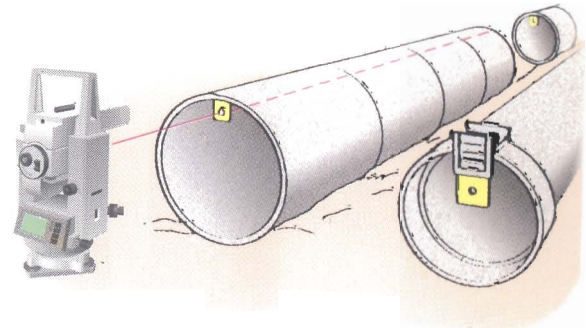
RS232C Data Output

External output is supported for angle reading data. The data can also be stored in an Electronic Field Book, helping to automate field operations related to civil engineering projects.

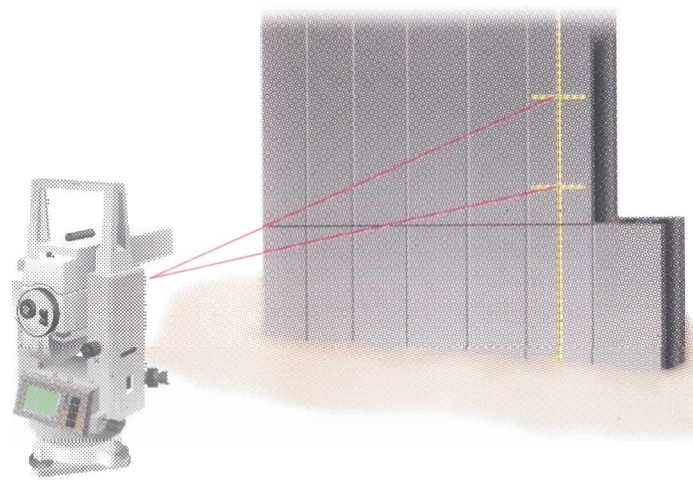
- Determining the direction and gradient for tunnelling and positioning of moles and mining machines



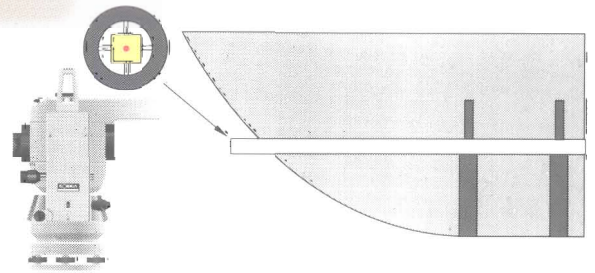
- Determining the direction and gradient for pipe laying



- Checking the vertical alignment of H-frame and steel pipes, etc.



- Centering the screw in shipbuilding



LDT5-LDT5S Specifications

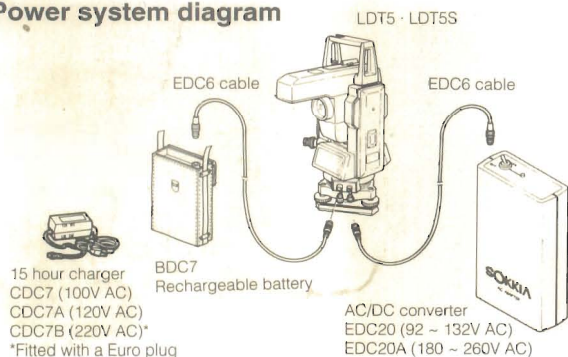
| | | |
|------------------------------|-------|--|
| Laser | | Class II laser product |
| Light source | | He-Ne gas laser |
| Output power | | Less than 1mW |
| Wavelength | | 632.8nm |
| Telescope | | |
| Length | | 160mm (6.3 in) |
| Objective aperture | | 42mm (1.8 in) |
| Magnification | | 30x |
| Image | | Erect |
| Resolving power | | 3" |
| Field of view (1000m) | | 1°30' (26m) |
| Minimum focus | | 1.3m (4.3 ft) |
| Stadia ratio | | 1:100 |
| Additive constant | | 0 |
| Reticle illumination | | Built in (brightness adjustable) |
| Angle measurement | | |
| Type | H & V | Photoelectric incremental rotary encoder scanning; both circles adopt diametrical detection; vertical circle provided with 0 index point |
| Display resolution | H & V | 5" (0.001gon, 0.02mil) |
| Accuracy | H & V | 7" (Standard deviation of mean of a measurement taken in position I and II, according to DIN 18723) |
| Measuring time | | Less than 0.5 seconds |
| Display mode | | |
| Horizontal | | Clockwise, Counterclockwise, selectable by control panel key |
| Vertical | | % of slope selectable by control panel key. Zenith angle (Zenith 0), Vertical angle (Horizontal 0), Height angle (Horizontal $\pm 90^\circ$), selectable by internal switch |

| | |
|------------------------------------|--|
| Display | |
| Display unit | LCD (2 line, 7 digits per line) with built-in illumination |
| Display range | Horizontal: 0°00'00" ~ 359°59'55" Vertical: 161° ~ Zenith 0° ~ 259° % of slope: -290% ~ 999.909% (on face left) |
| Sensitivity of levels | |
| Telescope level | 40"/2mm |
| Plate level | 40"/2mm |
| Circular level | 10"/2mm |
| Optical plummets | |
| Image | Erect |
| Magnification | 3x |
| Minimum focus | 0.1m (0.3 ft) |
| General | |
| Standing axis | Single |
| Interface | Asynchronous serial, RS232C compatible |
| Self-diagnostic function | Codes displayed |
| Operating temperature | -20 ~ +50°C (-4 ~ 122°F) |
| Tilting axis height | 236mm (9.3 in) |
| Size with handle | W143 x D248 x H368mm (W5.6 x D9.7 x H14.4 in) |
| Weight with handle | 6.3kg (13.9 lbs) |
| Power supplies | |
| Operating voltage: | 12V DC |
| (Standard) | |
| EDC20 AC/DC converter | Input: 92 ~ 132V AC; 50/60Hz; Output: 12V DC |
| EDC20A AC/DC converter | Input: 180 ~ 260V AC; 50/60Hz; Output: 12V DC |
| (Optional) | |
| BDC7 External rechargeable battery | Ni-Cd, Continuous use at 25°C (77°F): 35 hours with theodolite and laser; 50 hours with theodolite only Charging time: 15 hours at 25°C (77°F) with CDC7 series charger |

LDT5 and LDT5S come complete with:

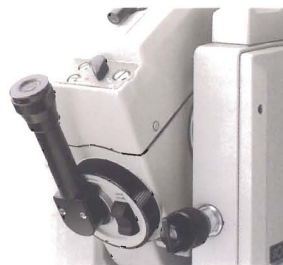
Main unit with removable or shifting base, EDC20 or EDC20A AC/DC converter, EDC6 cable, CP7 Tubular compass, Lens cap, Plumb bob, Vinyl cover, Tool kit, Operator's manual, and SC89 Carrying case.

Power system diagram



Optional accessories

- LCA2 Laser adapter
- DE17 Diagonal eyepiece
For sighting at steep angles up to zenith or when working in constricted space
- MA04A Solar filter for DE17
- EF2 Eyepiece solar filter
For protecting the operator's eye from sunlight in solar observation for azimuth angle measurement



DE17



EF2

Designs and specifications are subject to change without notice

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