

UNDERGROUND PRECISION ENGINEERING

The **DSD-III A Laser Guided Pilot Tube System** is a dedicated optical guidance solution designed for high-precision underground pipe jacking and tunneling. Equipped with a high-precision 2" electronic theodolite host, a submersible IP68 LED target, and a high-definition video display terminal, it delivers an exceptional **±5 mm / 100m accuracy**. Completely isolated from heavy machinery vibrations via a dedicated concrete pillar, it guarantees zero-drift precision in the harshest subsurface environments.



100M - 200M RANGE

±5MM ACCURACY

PRECISION MANUAL FOCUS

IP68 LED TARGET

ZERO-LATENCY VGA

VIBRATION ISOLATED

CORE SYSTEM ADVANTAGES

- **Absolute Coaxial Insertion:** Flush cylindrical target housing fits directly into the pilot tube cavity with an anti-rotation flat slot.
- **Zero-Drift Encoder:** 2" Absolute Encoder system retains precise zero position data even after a sudden power loss.
- **Impenetrable Illumination:** Custom high-lumen 5mm LED array with a professional collimator lens cuts through high-pressure mud and mist.
- **Precision Manual Focus:** High-precision manual focusing mechanism features smooth damping, offering an excellent operational experience for wide-angle searching and pinpoint aiming.
- **Absolute Stability:** Independent concrete pillar mounting completely isolates the optical base from the low-frequency rig vibrations.
- **Safe Pit Operation:** Powered directly by DC connection from the jacking machine, eliminating hazardous AC mains in the wet underground pit.

SYSTEM SPECIFICATIONS & CONFIGURATIONS

1. OVERALL SYSTEM PERFORMANCE

Max. Guidance Distance	Nominal 100 m (328 ft) / Up to 200 m for bidirectional jacking
System Accuracy	±5 mm / 100 m (Practical tolerance via physical 5mm LED edge limit)

2. ELECTRONIC THEODOLITE HOST (OPTICAL BASE)

Angle Accuracy	2" (0.6 mgon) Absolute Encoder (Retains zero after power loss)
Display Units / Min. Reading	DEG / MIL / GON / V% (Direct slope input) 1.0" (0.2 mgon)
Telescope Magnification / Aperture	30X (Surveying-grade telephoto) / 47 mm (High light intake)
Reticle Type / Focus System	Physical Engraved Crosshair / Advanced Precision Manual Focus Mechanism
Tilt Compensator	Single-axis Liquid-Electric (±3' range for minor vibration control)
Targeting Assist	Coaxial Red/Green Laser Pointer for initial long-distance acquisition
Mechanical Control	Horizontal/Vertical tangent screws with mechanical self-locking

3. VIDEO DISPLAY TERMINAL

Display Monitor / Interface	Large Industrial High-Brightness Anti-Glare LCD / VGA Analog Port
Video Transmission	Zero-latency physical cable transmission for real-time steering feedback
Cable Connectors	Military-Grade Threaded Aviation Plugs (Water/Mud resistant, vibration-proof)
System Power	Direct Current (DC) from jacking machine (Eliminates AC hazard)

4. HIGH-PRECISION LENS LED TARGET (UNDERGROUND CORE)

Optical Lens / Light Source	Professional Collimator Lens / Custom High-Lumen 5mm LED Array
Centering Design	Flush cylindrical housing for direct insertion into pilot tube cavity
Anti-Rotation Lock	Rectangular flat slot with direct screw clamping
Waterproof Rating	IP68 Submersible / Heavy-Duty Sealing against high-pressure mud
Battery Capacity	Built-in industrial battery supporting 4-5 days continuous illumination

5. HEAVY-DUTY MOUNTING & SUPPORT SYSTEM

Foundation Anchoring	Independent Concrete Pillar (100% isolation from rig vibrations)
Elevation Adjustment	Heavy-Duty Lifting Platform with manual crank and high-load lock

SYSTEM ARCHITECTURE NOTE:

The DSD-III A Laser Guided Pilot Tube System represents a holistic integration of precision surveying instruments and heavy-industry tunneling mechanics. The intrinsic theoretical error of the optical base is near zero; the stated ±5mm tolerance incorporates external variances from manual visual alignment under extreme underground conditions. Contact engineering support for custom rig mounting configurations.