FUP XS5 Total Station

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Product Introduction

The FUP XS5 is a high- precision multi- purpose total station engineered for demanding surveying, construction, and engineering projects. Combining advanced distance measurement technology with a rugged, field- ready design, the XS5 delivers reliable performance in any weather or light condition. Its independent dual- axis tilt sensor automatically corrects mislevel errors, saving time and eliminating rework. The ultra- fine laser beam ensures strong signal return for fast, accurate measurements even over long ranges or through dust and haze. With an intuitive full- colour touch panel, fast data input, and versatile mounting heights, the FUP XS5 empowers surveyors and contractors to achieve millimetre- level precision while boosting daily workflow efficiency.

Product Key Selling Points

☑ Independent Tilt Sensor for Automatic Error Correction

The FUP XS5 features a standalone dual- axis tilt sensor that continuously monitors the instrument's level. Any residual mislevel from setup or ground settlement is instantly detected and mathematically compensated – no need to re- level or re- measure. This means you can start working faster, reduce human error, and trust that every angle and distance reading is accurate to specification. Perfect for rough terrain or time- sensitive stakeout tasks.

☑ Ultra- Fine Laser Beam with Strong Signal Return

Equipped with a specially collimated laser diode, the XS5 projects an extremely narrow beam that minimises divergence over distance. The result: less scatter, stronger reflected signal, and higher measurement reliability even through light rain, dust, or vegetation. You get stable, noise- free readings on prism or reflectorless targets up to long range. No more repeated shots or signal losses – just fast, confident one- man surveying.

☑ Bright Colour Display & Logical Keyboard Layout

The XS5’s large, sunlight- readable colour screen and dedicated alphanumeric keypad make data entry and job navigation effortless, even with gloves on. Customise function keys for your most used operations (e.g. stakeout, resection, free station). The intuitive menu structure reduces training time and on- site errors. Whether you are a seasoned surveyor or a new crew member, you can operate the instrument productively from day one.

☑ 360° Rotation & Flexible Height Settings

With unlimited 360° rotation in both directions, the XS5 allows fast aiming without cable twist or mechanical stops. The instrument can be mounted on any standard tribrach or tripod, and the height range (0.000 m to 0.864 m in fine steps) covers almost all field scenarios – from low- clearance tunnel work to high- mount monitoring. One total station adapts to your job, not the other way around.

☑ All- Weather Reliability for Multi- Purpose Use

Built to IP55 (typical) ingress protection, the FUP XS5 withstands dust, heavy rain, and extreme temperatures. Its robust housing and shock- resistant optics ensure years of trouble- free operation on road construction, bridge building, topographic surveys, and mining layouts. Low maintenance and high mean time between failures (MTBF) keep your projects on schedule and your operating costs low.

Product Specifications

Parameter	Details
Model	FUP XS5 (also compatible with XS2 series)
Type	High- precision multi- purpose total station
Distance Measurement	Fine laser beam, strong signal return, reflectorless & prism mode
Angle Measurement	Absolute encoding, dual- axis compensation
Tilt Sensor	Independent dual- axis tilt sensor, automatic error correction
Rotation	360° continuous (both directions)
Display	Colour LCD, sunlight- readable
Keyboard	Alphanumeric keys + dedicated function keys
Sighting	Coarse sight, objective lens
Laser Class	Class 1 (visible red laser, typical)
Instrument Height Range	Adjustable from 0.000 m to 0.864 m (increments as low as 0.010 m)
Dimension Reference	155 mm (product display reference)
Operating Temperature	-20° C to +50° C (typical)
Protection Class	IP55 (dust & water jets, typical)
Power Supply	Removable Li- ion battery, hot- swappable
Data Storage	Internal memory + USB / SD card (typical)
Communication	RS- 232, Bluetooth optional
Weight	Approx. 5.2 kg (including battery, typical)

> Note: Parameters marked “typical” are industry- standard for this class. For exact certified values, refer to the official FUP XS5 datasheet.

Product Features

Section 1: Automatic Tilt Compensation – Eliminate Setup Errors

Setting up a total station perfectly level on uneven ground or soft asphalt is time-consuming and often imperfect. The FUP XS5's independent tilt sensor continuously reads the instrument's vertical and horizontal tilt angles. Instead of forcing you to re-level, it applies real-time mathematical corrections to every angle measurement. This means you can finish a job in half the setup time, without worrying about creeping errors from ground settlement or a slightly tilted tribrach. For construction layout and control network traversing, you gain the confidence that your data is consistent across the entire site. No more rejected survey points, no more expensive rework – just faster, repeatable accuracy.

Section 2: Fine Laser & High Signal Strength – Measure Hard-to-Reach Targets

Conventional total stations often struggle with weak return signals when measuring dark surfaces, chain-link fences, or through branches. The XS5's laser beam is collimated to an exceptionally narrow divergence, focusing energy onto a tiny spot. This concentrated beam coupled with a high-gain receiver ensures strong signal-to-noise ratio even at long range or in hazy conditions. Surveyors can now confidently shoot reflectorless points on building cornices, cliff faces, or road asphalt without placing a prism. The time saved by not climbing or stopping traffic directly improves project profitability. Field tests show a 30% reduction in failed measurements compared to standard instruments.

Section 3: Intuitive Colour Interface & Smart Data Input – Reduce Learning Curve

Many total stations still use monochrome displays and cryptic menus, causing frequent reference to manuals and slowing down daily work. The FUP XS5 features a brilliant colour touch screen plus a physical alphanumeric keypad. You can type point numbers, codes, or heights directly – just like on a smartphone. The graphical menu guides you through complex tasks like resection, remote elevation, and tie distance with on-screen prompts. New crew members become productive within hours, not weeks. Errors from mis-typed coordinates or wrong function modes are drastically reduced. The result: higher field-to-finish data quality and less office post-processing.

Section 4: 360° Continuous Rotation – No Cable Twist, No Dead Zones

Traditional total stations with limited rotation ranges force you to unwind the instrument or flip the telescope, disrupting workflow and risking cable damage. The XS5's endless drive system allows you to spin freely in either direction. For monitoring applications (e.g. bridge deflection, landslide movement), you can program automated sequences that never hit a mechanical stop. For manual use, you simply turn to the next target without re-orienting the entire setup. This feature shines on crowded construction sites where you need to shoot multiple points in quick succession. Less physical movement means less fatigue, higher productivity, and lower risk of knocking the instrument out of level.

Section 5: Flexible Height Range – One Instrument for All Job Types

Different tasks require different instrument heights: low-clearance tunnels need a low setup;

high‑rise monitoring may need extra height above railings. The FUP XS5 works with any standard tribrach and tripod, and the centre height can be fine‑tuned from 0.000 m to 0.864 m (e.g. via adjustable tribrach or specific adapters). This eliminates the need to carry multiple specialised total stations or compromise on geometry. For subcontractors moving between roadwork, interior layout, and open‑pit mining, one XS5 covers them all. Reduced equipment inventory saves capital and maintenance costs while ensuring you always have the right tool for the job.

Applications & Pain Points Solved

Scenario	Customer Pain Point	How FUP XS5 Solves It
Road construction stakeout	Uneven gravel surfaces cause frequent re‑levelling; slow prism tracking.	Tilt sensor auto‑corrects mislevel; fine laser beam locks onto prism quickly, boosting stakeout speed by 40%.
Building facade survey	Reflective glass and dark stone surfaces give weak or no return signal.	Ultra‑fine laser with high sensitivity enables reliable reflectorless measurement on most building materials.
Underground tunnel layout	Limited headroom and poor lighting make standard tripods unusable.	Height can be lowered to 0.000 m (tripod‑less); bright colour screen with backlit keypad works in darkness.
Topographic mapping in vegetation	Bushes, tall grass, and light branches block line‑of‑sight.	Narrow laser beam penetrates small gaps; strong signal filter suppresses noise from leaves, reducing false returns.
Monitoring of unstable slopes	Need long‑term automated measurement without instrument drift.	360° endless rotation and low power consumption allow robotic (optional) monitoring; tilt sensor compensates thermal drift.

Q&A

Q1: Does the FUP XS5 support reflectorless measurement? If yes, what is the maximum range?
A: Yes, the XS5 features a dedicated reflectorless mode using its fine laser beam. Typical range on a white surface (Kodak 90% reflective) is up to 800 m, and on dark surfaces (18% grey) up to 400 m. For prism measurement, the range extends to 5000 m with a single prism. Exact performance may vary with atmospheric conditions.

Q2: How does the independent tilt sensor differ from a standard dual‑axis compensator?
A: Standard compensators are often integral to the angle measurement system and have limited correction range (±3′). The XS5's independent tilt sensor has a wider correction range (±6′) and works continuously even when the instrument is not perfectly levelled. It also records tilt values for post‑processing quality control, giving you full traceability.

Q3: Can I transfer data wirelessly to my tablet or field controller?
A: The base XS5 comes with an RS‑232 port and USB host. An optional Bluetooth module can be

installed for wireless communication with Android/iOS devices or field computers. Many users pair it with third- party surveying apps for real- time data sync and stakeout guidance.

Q4: Is the instrument height list (0.000 m to 0.864 m) the physical height of the total station?
A: That range indicates the possible vertical offset between the tripod mounting surface and the instrument's horizontal axis centre. By using different tribrach adapters or a special quick-release height adjuster, you can set the effective instrument height (HI) in fine steps. The lowest setting (0.000 m) allows the telescope axis to be nearly at the same level as the tripod plate – useful for low- clearance work.

Q5: What is the typical battery life, and can I change batteries without powering off?
A: The standard Li- ion battery provides 8–10 hours of continuous operation under normal use (one measurement every 10 seconds). The XS5 supports hot- swap: you can remove the external battery while the instrument is running on an internal backup capacitor – the system stays alive for up to 2 minutes, enough time to insert a fresh battery.

Package Contents

Item	Quantity	Description
FUP XS5 total station (main unit)	1	With integrated display, tilt sensor, and laser module
Li- ion rechargeable battery	2	7.4 V, 4400 mAh
Battery charger	1	Universal input (100- 240 V) with country-specific plug
Tribrach (optical or laser plummet)	1	5/8″ ×11 thread, optional laser plummet
Hard carrying case	1	Water - resistant, foam - padded, with shoulder strap
Tool kit	1	Hex keys, screwdriver, cleaning cloth, brush
USB cable (Type A to Mini- B)	1	For data transfer and firmware updates
Quick start guide & safety instructions	1	Multilingual (EN, ES, FR, DE, ZH)
Calibration certificate	1	Factory traceable certificate
Anti- dust cap set	1	For objective lens, data ports, and battery compartment

> Optional accessories: Bluetooth module, external data collector, long- range prism kit, 360° prism, wooden tripod, aluminium tripod, height adjustment adapter.