



## TFN MW303 Laser Rangefinder



### Product Introduction

The MW303 is a professional, multi-function laser rangefinder designed for demanding field operations. It integrates ultra-long-range laser measurement (up to 10km), high-precision GPS/BeiDou positioning, digital compass, dual-axis inclinometer, and environmental sensors (temperature/humidity/barometer) into a rugged, IP67-rated handheld device. Featuring a 1535nm eye-safe laser, multi-target (up to 3 targets) ranging, and real-time relative positioning, the MW303 delivers unmatched accuracy and reliability for military, geodetic surveying, forestry, power line inspection, and search & rescue missions. With a 28-hour battery life, 32GB onboard storage, and seamless data export via USB/WiFi, this all-in-one solution eliminates the need for multiple instruments, boosting field efficiency and situational awareness.

### Product Key Selling Points

#### Ultra-Long Range with Multi-Target Measurement

The MW303 offers a stunning maximum range of  $\geq 10$  km on large targets ( $\geq 5$  km on small targets) with a minimum range of just 50 m. Its high-speed laser operates at 1-10 Hz adjustable frequency and can simultaneously capture up to three distinct targets – ideal for scanning multiple objects in complex environments. Whether you need to measure distance to a distant ridge, a power tower, or a moving vehicle, the MW303 provides fast, accurate readings (accuracy  $\pm 1$  m) even in rain or haze. This eliminates the need for separate long-range and short-range devices, saving weight and cost while improving mission responsiveness.

#### All-in-One GPS/BeiDou Positioning & Target Geolocation

Built-in multi-constellation receiver (GPS, BeiDou, Glonass, combined) provides your own position with 25m CEP horizontal and 10m PE vertical accuracy. More impressively, the MW303 calculates the absolute coordinates of remote targets (accuracy  $\leq 20$ m at 5km after map calibration) using laser distance, azimuth, and inclination. This is a game-changer for artillery adjustment, wildfire spotter reporting, or search coordination – you can immediately send target grids (in SK-42, WGS84, UTM, MGRS) to command centers or team members without any



additional mapping tools.

High-Precision Digital Compass & Dual-Axis Inclinometer

The MW303 incorporates a military-grade magnetic compass ( $0^\circ \sim 359^\circ$ , accuracy  $\leq 0.3^\circ$  RMS at  $0^\circ$  tilt) and a  $\pm 90^\circ$  inclinometer for pitch (accuracy  $\leq 0.1^\circ$ ) and  $\pm 180^\circ$  for roll (accuracy  $< 0.1^\circ$ ). After manual calibration and map declination correction, azimuth accuracy improves to  $\leq 0.1^\circ$  (2Mil) within  $\pm 65^\circ$  tilt range. This enables accurate slope distance to horizontal distance conversion, orientation for reconnaissance, and alignment for antenna or solar panel installation. Users no longer need to carry a separate compass or clinometer – the MW303 gives you precise angular data instantly, even when the device is tilted.

Rugged Environmental Toughness & Built-in Weather Sensors

Rated IP67 (waterproof and dust-tight), the MW303 operates flawlessly from  $-40^\circ\text{C}$  to  $60^\circ\text{C}$  and can be stored from  $-50^\circ\text{C}$  to  $70^\circ\text{C}$ . It withstands rain, snow, dust, and accidental submersion. Additionally, on-board sensors measure temperature ( $\pm 1^\circ\text{C}$ ), humidity ( $\pm 3\%RH$ ), and barometric pressure ( $\pm 2hPa$ ) – critical data for ballistic compensation, weather trend prediction, or microclimate monitoring at remote sites. The OLED display automatically brightens when you bring your eye close and dims when not in use, saving power and improving night vision safety. This rugged all-in-one design replaces multiple fragile instruments and survives the harshest job sites.

Long Battery Life, Large Storage & Flexible Data Export

Powered by four 18650 rechargeable lithium batteries, the MW303 delivers up to 28 hours of continuous operation on a full charge, and with external 12V power it can run 24/7. 32GB internal memory stores the last 10 distance measurement records and countless coordinate/angle logs. Data export is effortless via USB or Wi-Fi, supporting file transfer to laptops, tablets, or command systems. An RS232 interface and HDMI video output allow external control and real-time display sharing. For field teams conducting multi-day surveys or patrols, this ensures you never run out of power or storage, and you can integrate the rangefinder into larger C4I systems.

**Product Specifications**

Parameter	Details
<b>Optical Specifications</b>	
Optical Magnification	Txt+0.3x
Field of View	$6.7^\circ \sim 40.3^\circ$ (112m@1000m)
Focus Type	Focus-free (no adjustment needed)
Objective Diameter	33 mm
Diopter Adjustment	-5SD ~ +5SD
<b>Laser Ranging Specifications</b>	
Laser Wavelength	1535 nm (eye-safe)
Beam Divergence	$< 0.5$ mrad
Minimum Range	50 m
Maximum Range (Large Target)	$\geq 10$ km



Maximum Range (Small Target)	≥5 km
Ranging Accuracy	±1 m
Measurement Frequency	1 Hz ~ 10 Hz adjustable
Multi-Target Capability	Up to 3 targets simultaneously
Laser Lifetime	>50,000 measurements
Measurement Record	Last 10 targets
Units	Meters, yards, feet
Relative Ranging	Supports 3-point relative positioning
<b>Positioning Specifications</b>	
Positioning Modes	GPS / BeiDou / Glonass / Combined
Self- Positioning Accuracy	Horizontal: 25m (CEP), Vertical: 10m (PE)
Target Positioning Accuracy	≤20m (at 5km after map calibration)
Data Update Rate	1 ~ 10 Hz
Coordinate Systems	SK- 42 / WGS84
Map Projections	Gauss 6° / UTM / MGRS
<b>Orientation &amp; Inclinometer Specifications</b>	
Azimuth Range	0° ~ 359°
Azimuth Accuracy	≤0.3° (5Mil) RMS (device tilt = 0° )
Post- Map Correction Accuracy	≤0.1° (2Mil)
Pitch Range	+90° ~ -90°
Pitch Accuracy	≤0.1° (2Mil) RMS @ -81° ~ 81°
Roll Range	+180° ~ -180°
Roll Accuracy	<0.1° (2Mil) @ -65° ≤ tilt ≤ 65°
Compass Calibration	Manual
Angle Units	Degrees / Mils (Mil)
<b>Storage &amp; Data Management</b>	
Storage Capacity	32 GB
File Export Interfaces	USB / Wi- Fi
<b>Display Specifications</b>	
Display Type	OLED
Resolution	1920 × 1080
Display Size	0.5 inch (typical)
Exit Pupil Diameter	8 mm
Eye Relief	18 mm
Screen Protection	Auto- off when face away; auto- on when eye approaches; anti- light- leakage design
<b>External Interfaces</b>	
Ranging Button	Yes
External Power Input	12V (±3V)
External Control Command	RS232
Video Output	HDMI
<b>Continuous Operation Time</b>	
Battery Operating Time	28 hours



With External Power	≥24 hours continuous	
Battery Type	18650 rechargeable Li- ion (×4)	
<b>Physical Parameters</b>		
Dimensions (L×W×H)	190 mm × 125 mm × 70 mm	
Weight	0.8 kg	
<b>Environmental Adaptability</b>		
Ingress Protection	IP67 (waterproof, dust- tight)	
Operating Temperature	-40° C ~ 60° C	
Storage Temperature	-50° C ~ 70° C (optimal 0° C ~ 40° C)	
<b>Environmental Sensors (Meteorological)</b>		
Parameter	Measurement Range	Accuracy
Temperature	-40° C ~ 60° C	± 1° C
Humidity	0% RH ~ 100% RH	± 3% RH (15% - 90% RH); ± 5% RH (other ranges)
Barometric Pressure	200 hPa ~ 1100 hPa	± 2 hPa

## Product Features

### Section 1: Long- Range Laser Ranging & Multi- Target Detection

The MW303’s 1535nm laser delivers precise distance measurements up to 10 km on large targets (e.g., buildings, mountains) and 5 km on small targets (vehicles, towers). Its adjustable 1-10 Hz measurement frequency allows rapid scanning of moving objects, while the multi-target mode can lock onto up to three different objects in a single view – showing distances for the nearest, middle, and farthest targets simultaneously. This solves a major pain point for users who need to quickly assess a complex scene, such as a tree line with multiple towers or a group of vehicles. Traditional rangefinders only display the nearest or strongest reflection, forcing repeated measurements. The MW303 eliminates guesswork, saves time, and reduces operator fatigue. Combined with relative ranging function that calculates distances between three target points, it becomes an essential tool for field artillery adjustment, power line clearance measurement, and avalanche rescue positioning – all without moving from your observation point.

### Section 2: Precision Target Geolocation Without a Separate GPS

Many field professionals struggle to report the exact position of a distant object – a wildfire hotspot, a downed aircraft, or an illegal mining site – because they only have their own GPS coordinates. The MW303 solves this by integrating laser distance, digital compass bearing, and inclinometer angle to instantly compute the absolute coordinates of the target (in SK-42, WGS84, UTM, or MGRS). Users simply aim at the target, press the measure button, and the device displays both the distance and the target’s grid reference. This eliminates the need for manual map plotting or complex trigonometric calculations. With target positioning accuracy ≤20m at 5km (after map calibration) and self-positioning accuracy of 25m CEP, the MW303 provides actionable intelligence for artillery fire direction, search team coordination, and environmental monitoring. It reduces the risk of miscommunication (e.g., “ about 3 km northwest of my



location” ) and ensures that everyone on the team works with the same precise coordinates, improving mission safety and effectiveness.

### **Section 3: All- Weather Orientation & Slope Compensation**

Conventional compasses are useless when the device is tilted, and inclinometers alone don't give you true bearing. The MW303 features a fully compensated digital compass that maintains azimuth accuracy even when the device is rolled or pitched up to  $\pm 65^\circ$ . Its pitch ( $\pm 90^\circ$ ) and roll ( $\pm 180^\circ$ ) sensors provide high-accuracy angle data ( $\leq 0.1^\circ$  for pitch). This is critical for two common pain points: (1) measuring horizontal distance on a slope – the MW303 automatically calculates horizontal distance from slope range and inclination, essential for forestry or avalanche control; (2) aligning directional antennas or solar panels – you can read both bearing and tilt in one tool. Additionally, manual compass calibration with map declination correction ensures true north referencing. Users no longer need to carry a separate lensatic compass, clinometer, or protractor. The MW303 also outputs angles in degrees or mils (mils for artillery/military users), and its large, clear OLED display ensures readability under bright sunlight or total darkness.

### **Section 4: Ruggedized Design with Environmental Sensors for Field Decision Support**

Working in extreme weather is a daily reality for surveyors, soldiers, and utility inspectors. The MW303 is built to IP67 standards – completely dust-tight and waterproof up to 1 meter for 30 minutes. It operates reliably from  $-40^\circ\text{C}$  arctic conditions to  $+60^\circ\text{C}$  desert heat. But toughness alone is not enough; the built-in temperature, humidity, and barometric pressure sensors provide real-time micro-weather data at the user's location. This solves the problem of carrying separate weather meters or guessing environmental conditions. For snipers and long-range shooters, the MW303's atmospheric data supports ballistic calculations (air density, crosswind effect). For firefighting commanders, dropping humidity and rising temperature indicate worsening fire behavior. For geodetic surveyors, pressure readings help with elevation correction. The OLED screen automatically dims when your face moves away (saving battery and preventing light discipline compromise in tactical situations) and brightens instantly when you look through the eyepiece. This smart power management combines with 28-hour battery life to keep you operational through multi-day missions without external charging.

### **Section 5: Seamless Data Logging, Export & Integration**

Field data is valuable only if you can store it, share it, and use it in your workflow. The MW303 features 32GB of internal memory, capable of storing tens of thousands of measurement records including range, azimuth, inclination, target coordinates, time stamps, and environmental data. Users can recall the last 10 distance measurements directly on the display for quick comparison. For larger datasets, data export is simple: via USB cable (plug-and-play, recognized as mass storage), or via Wi-Fi for wireless transfer to smartphones, tablets, or laptops. The RS232 interface allows remote control and data streaming to external command and control systems, making the MW303 an ideal sensor for robotic platforms or fixed observation posts. HDMI output mirrors the display to a larger monitor for training or command center viewing. These connectivity features solve a key pain point for professional users: manual transcription errors and tedious report writing. You can record, export, and integrate data directly into GIS software,



after-action reports, or fire control systems – saving hours of administrative work and improving data accuracy.

### Applications & Pain Points Solved

Scenario	Customer Pain Point	How MW303 Solves It
Military Reconnaissance & Artillery Forward Observation	FOOs need to quickly locate enemy positions, measure distance, and send accurate grid coordinates under time pressure and hostile conditions. Carrying separate laser rangefinder, GPS, compass, and weather meter is heavy and slow.	MW303 combines 10km laser ranging, GPS/BeiDou target geolocation, digital compass, and environmental sensors in one IP67 rugged device. One button gives range + target coordinates (MGRS/UTM). 28h battery and -40° C operation ensure mission readiness.
Wildfire Fighting & Emergency Search & Rescue	Spotters cannot describe the exact location of a fire front or lost hiker from a distant ridge. Radio descriptions like “about 2 km east of my position” are vague and delay response.	MW303’s target positioning outputs absolute coordinates of the fire or victim. Teams can share precise grids via radio or WiFi. Built-in temp/humidity/barometer helps predict fire spread or weather deterioration. IP67 works in smoke, rain, and ash.
Power Line & Telecommunication Tower Inspection	Inspectors need to measure sagging clearance between conductors and trees/buildings, but conventional rangefinders cannot calculate relative distances between multiple points (e.g., tower A to tower B, tree to line).	MW303’s multi-target and relative ranging function measures up to three target points and calculates the distance between any two – perfect for span length, conductor-to-ground clearance, and vegetation encroachment. 1-10Hz fast measurement for scanning along a line.
Geodetic Surveying & Mining	Surveyors often work in remote areas with no network RTK. They require accurate self-positioning, target coordinate capture, and data export for GIS. Carrying a total station is overkill for rough terrain.	MW303 provides self-positioning (25m CEP) and target geolocation ( $\leq 20m @ 5km$ ). Outputs coordinates in SK-42/WGS84 and UTM/MGRS. 32GB memory + USB/WiFi export streamlines field-to-office workflow. Lightweight (0.8kg) and focus-free optical design saves time.
Long-Range Shooting & Ballistics	Precision shooters need slope distance, horizontal distance, azimuth, temperature, humidity, and barometric pressure to calculate bullet drop and wind drift. Carrying a kestrel, compass, and rangefinder is cumbersome.	MW303 integrates all required sensors: laser range (slope), inclinometer (angle → horizontal distance), digital compass (azimuth), and weather sensors. Data can be manually recorded or exported for ballistics software. 1535nm laser is eye-safe and performs well in mirage/haze.



## Q&A

Q1: What is the maximum measurement distance of the MW303 in real-world conditions?

A: The MW303 can measure up to  $\geq 10$  km on large reflective targets (e.g., buildings, metal structures, rock faces) and  $\geq 5$  km on small or non-reflective targets (e.g., vehicles, trees). Actual performance may vary depending on atmospheric conditions (haze, rain, fog), target reflectivity, and background light. For typical military or surveying applications at 3-5 km, it provides reliable, repeatable readings with  $\pm 1$ m accuracy.

Q2: Does the MW303 require line of sight for target positioning?

A: Yes, like all laser rangefinders, the MW303 requires a clear line of sight to the target to obtain distance. However, once distance, azimuth, and inclination are measured, the device calculates target coordinates even if the target subsequently moves behind cover. The positioning function does not require a continuous GPS signal on the target – only the operator’s own GPS/BeiDou fix and the laser/compass data.

Q3: Can I export measurement data to my smartphone or computer wirelessly?

A: Absolutely. The MW303 supports Wi-Fi data export. You can connect the device to your phone, tablet, or laptop via its built-in Wi-Fi hotspot mode, then download recorded measurements (ranges, angles, coordinates, timestamps, environmental readings) as files. Alternatively, use the USB port for direct mass storage access – no special driver needed. RS232 is also available for integration with external systems.

Q4: Is the MW303 suitable for use in heavy rain or dusty environments?

A: Yes, the MW303 is rated IP67 – fully dust-tight and protected against immersion in water up to 1 meter for 30 minutes. It can withstand heavy rain, snow, dust storms, and accidental drops into puddles. The operating temperature range ( $-40^{\circ}$  C to  $60^{\circ}$  C) ensures functionality in arctic cold or desert heat. However, optical lens surfaces should be kept clean using the included cleaning tool for best laser transmission.

Q5: What batteries does the MW303 use, and how long do they last?

A: The device uses four standard 18650 rechargeable lithium-ion batteries (included). On a full charge, it provides up to 28 hours of continuous operation (mixed use of ranging, GPS, compass, and display). For extended missions, you can connect an external 12V DC power source (e.g., vehicle battery or solar panel) for  $\geq 24$  hours of non-stop running. The batteries are user-replaceable in the field.

## Package Contents

No.	Item Name	Quantity	Remarks
1	MW303 Laser Rangefinder (Main Unit)	1	With hand strap and eyepiece cover
2	18650 Rechargeable Li-ion Battery	4	High-capacity, 3.7V
3	Charger Kit	1 set	Includes: battery charger (1), AC power



			adapter (1), car charger adapter (1)
4	Multi- function Data Cable	1	USB - A to proprietary (data + charging)
5	Cleaning Tool	1	Lens brush + microfiber cloth
6	Neck Strap	1	Adjustable, quick- release
7	User Manual & Warranty Card	1	Multi - language available: English, Chinese, etc.
8	Certificate of Conformity	1	Factory calibration test report
9	Heavy - duty Safety Transport Case	1	Hard plastic, IP67 rated, custom foam insert

Note: All accessories are subject to change without notice. Contact your sales representative for the latest configuration and optional accessories (e.g., tripod adapter, external HDMI monitor, remote trigger switch).