TFN TD87 Handheld Binocular Multifunctional Infrared Thermal Imager

Product Introduction

The TFN TD87 is a professional handheld binocular multifunctional infrared thermal imager that fuses thermal imaging and low-light CMOS sensor data through advanced algorithms. It highlights heat targets while retaining environmental background details, enabling users to observe clearly in total darkness, smoke, or adverse weather. With built-in GPS, Wi-Fi, electronic compass, and multiple image fusion modes (white hot, black hot, fusion color, etc.), the TD87 delivers superior target recognition and situational awareness. Rugged, lightweight (1.51kg), and IP67 rated, it meets military standards (GJB150). Ideal for tactical reconnaissance, law enforcement, firefighting, power inspection, and maritime rescue, the TD87 ensures 24/7 operation in the harshest conditions.

Product Key Selling Points

☑ Advanced Multi-Spectrum Image Fusion for Unmatched Target Detection

The TD87 fuses thermal and low-light images in real time. Unlike pure thermal cameras, it preserves background contours while highlighting hot targets. Users can choose from fusion color, fusion gray, fusion black/white, and picture-in-picture modes. This dramatically improves detection of camouflaged or hidden objects in complete darkness, smoke, or fog – solving the pain point of missing critical threats due to poor visibility.

☑ Exceptional Detection Range and All-Weather Operation

Equipped with a 384×288 uncooled VOx detector (≤35mK NETD) and a 50mm infrared lens, the TD87 detects a human target at 1470m (recognition) and 368m (identification). The low-light CMOS (1280×720, 6μm) extends recognition to 1470m at 10^{-1} lx. Operating from -40° C to +55° C with IP67 protection, it works in rain, dust, and extreme cold – solving the pain of equipment failure in harsh environments.

☑ High-Resolution Binocular OLED Display for Reduced Eye Fatigue

Dual 1024×768 OLED displays provide crisp, natural viewing. Unlike single-eyepiece devices, the binocular design matches human binocular vision, reducing eye strain during long missions.

Adjustable diopter rings accommodate individual eyesight. This solves the pain of operator fatigue and headache after hours of surveillance, allowing comfortable all- night observation without compromising alertness.

☑ Smart Features: GPS, Electronic Compass, Wi- Fi, and 16GB Storage

Built- in GPS logs precise coordinates on screen; the electronic compass (accuracy ≤0.5° azimuth, ≤0.3° pitch) aids navigation and target geo- location. Wi- Fi enables remote viewing via mobile devices. 16GB TF card stores AVI videos and JPEG photos via one- touch record/capture. These features solve the pain of disorientation and lack of evidence documentation in field operations.

☑ Rugged, Portable Design with Long 5- Hour Battery Life

Weighing only 1.51kg and measuring 189.4×194×72.9mm, the TD87 is easy to carry. Four 18650 low- temperature batteries deliver 5 hours continuous operation. The RS232 and USB 2.0 interfaces allow external control and data export. IP67 rating withstands immersion. This solves the pain of heavy, short- lasting equipment that fails in wet or freezing conditions – ideal for patrols, search & rescue, and border security.

Product Specifications

Parameter	**Specification**
Infrared Thermal Imager	
Detector Type	Uncooled VOx FPA
Resolution	384×288 pixels
Spectral Range	8–14 μm
NETD	≤35mK @ F1.0, 300K
Frame Rate	50Hz
Signal-to-Noise Ratio	56dB
Non-uniformity Correction	Auto / Manual
Image Processing	Digital Detail Enhancement (DDE)
Digital Zoom	1×, 2×, 4×
Lens Focal Length	50mm
Lens Field of View	12.4° × 7°
Detection Range (Human 1.8m×0.5m)	1470m (recognition), 368m (identification), 184m (detection) – Johnson criteria, visibility ≥10km, humidity ≤60%, ΔT ≥2K
Detection Range (Vehicle 2.3m×2.3m)	4510m (recognition), 1128m (identification), 564m (detection)
Low- Light CMOS	
Detector Type	Low- illumination color CMOS
Effective Pixels	1280×720
Pixel Size	6 μm
Dynamic Range	76dB
Frame Rate	50Hz

SNR (10^{-1} lx / 10^{-2} lx / 10^{-3} lx)	60dB / 55dB / 45dB
Lens Focal Length	35mm
Lens Field of View	12.4° × 7°
Detection Range (Human) @ 10^{-1} lx	1470m (recognition), 368m (identification)
@ 10^{-2} lx	1200m (recognition), 300m (identification)
@ 10^{-3} lx	980m (recognition), 254m (identification)
Display	
Type	OLED binocular
Resolution	1024×768
Image Polarity	White hot, Black hot, Low-light, Fusion (color/gray/B&W), Picture-in-picture
Storage & Recording	
Internal Storage	16GB TF card
Video Format	AVI
General	
Continuous Operating Time	5 hours (with 4×18650 batteries)
Weight	1.51kg
Dimensions (L×W×H)	189.4mm × 194mm × 72.9mm (including eyecup)
Power Input	DC 12V
Video Output	VGA
Data Interface	USB 2.0
Control Interface	RS232
Operating Temperature	-40° C ~ +55° C
Storage Temperature	-50° C ~ +60° C
Humidity	≤90%
Protection Rating	IP67
Optional Electronic Compass	Azimuth accuracy ≤0.5°, Pitch accuracy ≤0.3°
Other Features	GPS, Wi-Fi, customizable military green finish

Product Features

Section 1: Multi-Mode Image Fusion---Eliminate Blind Spots in Total Darkness

The TFN TD87 uniquely combines thermal and low-light video streams. Pure thermal imagers lose background texture, making navigation difficult; pure low-light cameras fail in zero-lux environments. Our fusion algorithm overlays hot targets onto a visible-light backdrop, offering six fusion modes (color, gray, B&W, etc.). In a forest or urban rubble, you see both the warm body of a suspect and the cold branches or walls around him. This solves the critical pain of misinterpreting terrain or missing hidden threats. Operators can instantly switch between white hot, black hot, low-light only, or fusion – adapting to smoke, fog, or complete darkness. The

result is faster, more accurate target acquisition with less cognitive load.

Section 2: Long-Range Recognition with DDE --- Identify Threats Before They See You

With a 50mm infrared lens and 384×288 detector, the TD87 recognizes a human at 1470m – over 0.9 miles. Digital Detail Enhancement (DDE) sharpens edges and improves contrast, so a crouching figure is distinguishable from a bush. The low- light CMOS extends recognition to 1470m under starlight. For security teams patrolling borders or perimeters, this means you can identify an intruder or vehicle long before they enter your vulnerable zone. The pain of being outranged by adversaries is eliminated. You gain critical reaction time and tactical advantage, even in haze or light rain where optical scopes fail.

Section 3: Binocular OLED with Diopter Adjustment---End Eye Strain on Long Missions

Single-tube night vision devices force one eye to work while the other rests, causing severe fatigue and headaches after 30 minutes. The TD87's dual 1024×768 OLED displays provide natural binocular vision, preserving depth perception and reducing strain. Each eyepiece has independent diopter adjustment (±5 diopters), so users wearing glasses can observe without discomfort. The OLED panels offer high contrast and fast response, with no lag during panning. For surveillance teams on 5-hour night shifts, this feature directly solves the pain of physical exhaustion and dropped alertness. You stay comfortable and focused, ready to act at any moment.

Section 4: Integrated GPS, Electronic Compass & Wi-Fi --- Never Get Lost, Always Document

Field operators often struggle to report exact target locations or navigate unfamiliar terrain. The TD87 overlays real-time GPS coordinates and azimuth/pitch from the electronic compass directly on the image. You can mark a suspicious object's position instantly. Wi-Fi streaming allows a command post to see what you see, enabling remote decision- making. All images and videos (AVI) are saved to 16GB internal storage with a single button press. This solves the pain of poor situational awareness and lack of evidence. After a mission, export data via USB 2.0 or RS232 for debriefing. No more guesswork or handwritten notes under stress.

Section 5: Rugged IP67 & Extreme Temperature Operation---Reliable in Any Disaster

Firefighters, maritime rescuers, and military units operate in rain, mud, snow, and heat. The TD87 is built to MIL-GJB150 standards: IP67 rated (dust-tight and waterproof to 1m for 30 minutes), operating from -40° C to +55° C, and surviving -50° C storage. The four 18650 low-temperature batteries provide 5 hours of continuous run time. You can submerge it, drop it in mud, or use it in an Arctic night – it keeps working. This solves the pain of delicate equipment failing when you need it most. The TD87 is a true all-weather, all-terrain tool for frontline professionals.

Applications & Pain Points Solved

Scenario	Pain Point Solved
Tactical Reconnaissance & Border Patrol	In total darkness, conventional optics are useless. Pure thermal lacks detail for navigation. The TD87's fusion mode reveals both hidden persons and terrain contours, enabling silent approach and safe

	movement. GPS/compass mark exact infiltration points.
Law Enforcement & Anti-Camouflage	Suspects hiding in dense vegetation, urban debris, or smoke are invisible to the naked eye or low-light cameras. Thermal fusion cuts through camouflage-body heat stands out. Multiple image polarities (white hot, black hot) adapt to different backgrounds.
Firefighting & Search & Rescue	Thick smoke blinds visible cameras. The TD87 sees through smoke to locate victims and hotspots. The low-light channel helps firefighters navigate room layouts. IP67 waterproofing survives hose spray and rubble. Long battery life supports extended operations.
Power Line & Pipeline Inspection	Inspecting high-voltage lines or gas pipelines at night is dangerous and inefficient. The TD87 detects overheating components (thermal) while recording GPS-tagged images for reports. Wi-Fi allows a ground observer to monitor what the inspector sees from a safe distance.
Maritime & Coastal Surveillance	At sea, fog and spray reduce visibility. Thermal fusion pierces fog to spot vessels, debris, or people in water. Electronic compass provides bearing to target. The device is lightweight for handheld use on a boat and IP67 resists salt spray.

Q&A

Q1: What is the maximum detection range of the TFN TD87 for a human target?
A1: Under standard conditions (visibility ≥10km, humidity ≤60%, temperature difference ≥2K), the TD87 can detect a human (1.8m×0.5m) at 184m (detection), 1470m (recognition – you can identify it as a person), and 368m (identification--you can see details like weapon or uniform). The low-light channel achieves 1470m recognition at 10^{-1} lx.

Q2: Can I use the TD87 in complete darkness, like inside a cave or a windowless building?
A2: Yes. The thermal imager does not need any ambient light---it detects heat radiation (8–14 μm). Even in zero-lux total darkness, the TD87 produces clear thermal images. The low-light CMOS also works in starlight, but for pitch-black environments, use thermal or fusion modes.

Q3: How long do the batteries last, and what type do they use?
A3: The TD87 runs for 5 continuous hours on four 18650 rechargeable low-temperature batteries. The package includes 4 batteries and a charger. You can carry spare sets for extended missions. The battery compartment is easy to open (rotary knob) with polarity markings to prevent wrong insertion.

Q4: Is the device waterproof and dustproof?
A4: Yes, the TD87 has an IP67 protection rating. It is completely dust-tight and can be immersed in water up to 1 meter for 30 minutes. It also withstands humidity ≤90% and operates from -40° C to +55° C, making it suitable for heavy rain, snow, desert dust, and marine environments.

Q5: Can I record videos and take photos? How to export them?
A5: Yes. Short-press the designated button to capture a photo (JPEG); long-press to start/stop

video recording (AVI format). All files are saved to the internal 16GB TF card. To export, connect the USB cable to a computer -- the device appears as a removable drive. For rugged use, the LEMO waterproof connector ensures reliable data transfer.

Package Contents

TFN TD87 Multifunctional Fusion Night Vision Device * 1 unit
Battery Charger (for 18650 batteries) * 1 set
Data / USB Cable *1 cable
18650 Low-Temperature Rechargeable Batteries * 4 cells
User Manual (Operation & Maintenance Guide) * 1 copy
Protective Carrying Case (hard shell) * 1 box