TFN TD401 Wide Field of View Quad-Tube Helmet-Mounted Night Vision Goggle

Product Introduction

The TFN TD401 is a helmet- mounted, wide- field- of- view (FOV) night vision goggle that integrates four independent image intensifier tubes and objective lenses in a panoramic arrangement. It amplifies ambient night light (starlight, moonlight) and near- infrared radiation to deliver a bright, clear, green- phosphor image without active illumination. With a massive ≥ 92° ×35° FOV – more than double that of traditional dual- tube goggles – the TD401 drastically reduces head sweeping, lowers operator fatigue, and prevents exposure of movement. It is designed for special operations, urban warfare, coastal raids, and reconnaissance, enabling faster OODA loop (Observe- Orient- Decide- Act) execution. The unit features independent diopter adjustment, interpupillary adjustment, tilt, fore- aft, and vertical positioning, plus an external battery pack for extended missions. Lightweight (≤765g) and rugged, it operates from -45° C to 50° C, giving warfighters unmatched situational awareness in total darkness.

Product Key Selling Points

☑ Ultra- Wide Panoramic Field of View – Eliminate Blind Spots

The TFN TD401 uses advanced external FOV stitching technology to combine four micro- light channels, delivering a 92° horizontal × 35° vertical field of view – nearly 2.5x wider than standard dual- tube goggles. This panoramic vision allows operators to detect threats and terrain changes in their periphery without constantly turning their head. You reduce motion signatures, lower neck strain, and maintain full tactical focus. No more "looking through straws"; experience natural, expansive night vision that keeps you aware of every movement around you.

☑ Four Independent Image Intensifier Tubes – Redundant Reliability

Unlike gimmick quad designs, each of the four optical channels in the TD401 operates independently. If one tube is damaged or fails, the remaining three continue to provide functional night vision. This redundancy is critical for high- risk missions – from airborne

operations to maritime insertions. Furthermore, independent focusing per channel (350mm to infinity) lets you adjust each objective lens separately, ensuring razor- sharp details for both near- field map reading and long- range target identification simultaneously.

☑ Ergonomic Fit & Multi- Axis Adjustability – One- Size- Fits- All Combatants

Mission effectiveness depends on comfort. The TD401 features six degrees of mechanical adjustment: vertical (up/down), fore- aft (eye relief), interpupillary (IPD), tilt (roll), and diopter (+2 to -6) via interchangeable eyepiece caps. The flip- up mechanism with a lock release button automatically cuts power when raised and restores it when lowered, saving batteries. Whether you wear spectacles, a gas mask, or a different helmet type, you can achieve perfect eye alignment in seconds. No more headaches, eye strain, or half- seen images – just intuitive, fatigue- free observation.

☑ Low- Battery Warning & Efficient Power Management – Stay Operational

Powered by four widely available AA batteries (alkaline or lithium), the external battery pack is attached to the rear of the helmet via Velcro, balancing the goggle's weight. A bright LED on the mounting bracket flashes continuously when voltage drops to emergency level, giving you a clear 2- hour warning to swap batteries. The total runtime depends on conditions, but the smart power circuit and instant on/off via flip- up ensure you never get caught in darkness unexpectedly. Field- replaceable AA batteries mean no proprietary chargers – a true combat logistics advantage.

☑ Built for Extreme Environments – From Arctic to Desert

Ruggedized to military standards, the TD401 operates in temperatures from -45° C to 50° C and can be stored from -55° C to 70° C. The housing is sealed against dust and moisture (with nitrogen purging to 20kPa to prevent internal fogging). The objective lenses come with protective covers that have a small aperture – allowing safe daytime testing without damaging the image intensifiers. Whether you are patrolling frozen tundras, humid jungles, or sandy deserts, this night vision goggle maintains its resolution (≤1.0 mrad at high contrast) and optical performance. It is a tool you can trust when survival depends on gear.

Product Specifications

Parameter	Specification
Model	TFN TD401
Type	Helmet- mounted quad- tube night vision goggle (image intensifier- Gen 2+ / Super II)
Magnification	1× ±0.05×
Field of View (FOV)	≥92° (horizontal) × 35° (vertical) – panoramic stitching
Resolution	≤1.0 mrad (85–90% contrast, 1×10^{-1} Lx illumination); ≤2.4 mrad (35–40% contrast, 1×10^{-3} Lx)
Focus Range	350 mm to infinity (independent objective focus per channel)
Diopter Adjustment	+2 to -6 diopters (via interchangeable eyepiece caps)
Exit Pupil Diameter	≥14 mm
Eye Relief (Eye Point	≥25 mm

Distance)	
Distortion (Full FOV)	≤4%
Recognition Range	≥100 m (1.7m × 0.5m human target, clear starlight 1×10^{-3} to 3×10^{-3} Lx, visibility >10 km)
Power Supply	External battery pack, 4× AA batteries (1.5V alkaline or lithium)
Low Battery Indication	Flashing LED on mounting bracket (≥2 hours emergency use after first flash)
Weight (Host, without battery pack)	≤765 g
Operating Temperature	-45° C to +50° C
Storage Temperature	-55° C to +70° C
Nitrogen Fill Pressure	20 kPa (prevents internal fogging)
Mount Interface	Flip - up helmet bracket with automatic power cut - off; separable elastic ball mount
Adjustability	Vertical, fore- aft (eye relief), interpupillary (IPD), tilt (roll)
Construction	Rugged, non- magnetic, corrosion- resistant

Product Features

Section 1: Panoramic Stitching – Full Peripheral Awareness Without Head Sweeps

Traditional dual - tube night vision creates a narrow 40° tunnel vision, forcing you to constantly rotate your head – a movement that reveals your position and slows reaction. The TD401 solves this by integrating four independent micro - light channels using external FOV stitching. The two center tubes provide depth perception as usual, while the two outer tubes are angled to expand the horizontal view to 92°. The resulting image is seamless and natural, letting you see threats, obstacles, or teammates in your periphery without moving your head. You will maneuver faster in CQB (close quarters battle), drive vehicles safely blackout, and maintain covert posture. Reduced head motion also diminishes neck fatigue during long patrols. This feature directly addresses the operator's need for faster OODA loop and total scene dominance.

Section 2: Independent Per- Channel Focusing – Sharp Vision from Maps to Horizon

In dynamic environments, you might need to read a map at arm's length (350mm) and then instantly scan a ridge 500m away. Most night vision goggles have a fixed or single - ring focus that compromises one distance. The TD401 gives each of the four objective lenses its own focus ring. You can set the two outer tubes to infinity for distant surveillance and the inner tubes to near- field for equipment checks – or simply adjust all four to match your mission profile. This is not a gimmick; it's a tactical advantage. For medics, mechanics, or leaders who switch between close - up tasks and distance scanning, the TD401 eliminates blurry transitions. Every object, whether 0.35m or infinity, can be razor - sharp, increasing accuracy and reducing eye strain.

Section 3: Helmet Integration with Flip- Up Auto Shut- Off – Instant Transition to White Light

Moving from darkness to a lit compound or vehicle interior normally requires fumbling for power switches while keeping your weapon ready. The TD401's helmet mount includes a spring-loaded flip-up mechanism with a lock release button. When you raise the goggle to its stowage position, the power supply is automatically interrupted – saving batteries and protecting tubes from bright light. Lower it back to your eyes, and power resumes instantly, no buttons pressed. In emergency situations, you can also forcefully pull the goggle forward to detach it from the bracket (breakaway design). The vertical, fore-aft, and tilt adjustments stay locked after repeated flips. This design supports rapid transition to night vision or naked-eye/white-light use, keeping your hands on your weapon and your attention on the threat.

Section 4: Extreme Low-Light Performance & Tube Protection – Operate in Near-Darkness

Using high-sensitivity Super II image intensifiers, the TD401 delivers usable imagery under starlight (1×10^{-3} Lx) and even overcast conditions. The objective covers have a small aperture that can be fully closed during daytime testing to prevent photocathode damage. The system also features automatic brightness control (ABC) and a bright light cut-off to protect against sudden light spikes (e.g., muzzle flash or headlights). For long stationary observation, you can close the aperture entirely. The nitrogen purging eliminates internal lens fogging when moving between temperature extremes. This means you can deploy the TD401 from a warm tent into -45° C snow and still see crisp images without waiting for defogging. It's built for the worst ambient light conditions Mother Nature can throw at you.

Section 5: Modular Battery & Cable Management – Balanced, Silent, and Field Serviceable

Counterweights and dangling cables can ruin helmet balance and snag on gear. The TD401 attaches its battery pack to the rear of the helmet using Velcro (hook-and-loop), acting as a counterweight to the front goggle mass. The cable runs neatly from the pack to the mount's power connector. The battery box holds 4× AA batteries – available in any corner of the world. No special Li-ion packs, no forgotten chargers. A low-battery LED on the mount flashes visibly in the user's peripheral vision, giving a discreet 2-hour emergency window to swap cells. The power switch is located on the battery box, so you can cut power without reaching your helmet front. This ergonomic design reduces head-heavy fatigue, eliminates snap hazards, and keeps you fighting longer.

Applications & Pain Points Solved

Scenario	Customer Pain Point	TD401 Solution
Special Operations / Direct Action	Nighttime raids, room clearing, and target interdiction. Operators must maintain situational awareness while moving fast and silent.	Narrow FOV of traditional NVGs forces head sweeping → increases exposure risk and slows reaction. TD401's 92° panoramic view allows threat detection in periphery without moving head, enabling faster CQB decision-making.
Vehicle / Convoy Driving with Blackout Lights	Military vehicles, helicopters, or boats moving at night without headlights. Drivers need	Standard 40° goggles create dangerous blind spots for side mirrors and road shoulders. TD401 provides wide enough view to check instruments and flanks with natural eye movement –

	to see road edges, obstacles, and pedestrians.	reduces accidents and driver fatigue.
Maritime & Coastal Operations	Nighttime beach landings, ship boarding, and harbor security. High humidity, salt spray, and rapid temperature changes.	Many NVGs fog internally or corrode. TD401's nitrogen purge (20kPa) stops fogging, and the sealed housing resists salt air. Wide FOV helps spot obstacles in surf or on deck.
Urban Warfare / MOUT	Fighting in built- up areas with multiple story buildings, dark alleys, and open sewers. Need to scan both high and low, near and far.	Constant up- down head movement strains neck and causes disorientation. TD401's tilt adjustment and large vertical FOV (35°) let you transition from ground to upper floors with less head tilt, plus independent focusing for short- range rubble and long- range sniper positions.
Search & Rescue / Border Patrol	Locating lost persons or smugglers over large open terrain (desert, forest, mountains). Long hours of observation.	Operator fatigue from heavy, unbalanced goggles reduces vigilance. TD401's rear battery pack balances weight, and the flip- up auto- off saves battery during breaks. The low- battery LED prevents sudden power loss. Wide FOV allows scanning wide valleys without panning.

Q&A

Q1: Can I use the TFN TD401 during the day without damaging it?
A: No, you must never remove the objective lens covers in bright daylight. The covers have a small pinhole that allows safe daytime function checks without overloading the image intensifier tubes. For extended daytime testing or very high- brightness conditions (direct sunlight), also close the pinhole. The unit is designed for night use only; exposure to strong light can permanently degrade tube performance.

Q2: What is the battery life on 4× AA batteries?
A: Runtime depends on battery brand and temperature. Typically, fresh alkaline AA batteries provide 25 - 40 hours of continuous operation. The low - battery LED flashes when approximately 2 hours of emergency power remain. Lithium AA batteries perform better in cold environments. The external battery pack is easy to swap, so carrying spare AA cells is recommended for long missions.

Q3: Does the TD401 fit any helmet?
A: The TD401 comes with a helmet mounting bracket that attaches to standard NVG shroud interfaces (such as Wilcox or Norotos style). The package includes hook- and- loop Velcro for the rear battery pack, which adheres to most helmet shells. Vertical, fore- aft, tilt, and IPD adjustments ensure compatibility with different helmet shapes, sizes, and even users wearing glasses or gas masks.

Q4: How do I clean the lenses and maintain the goggle?

A: Use the included lens brush to remove dust, then a clean microfiber cloth (200mm×200mm) or lens paper with a small amount of alcohol for smudges. Never touch the glass with bare fingers. Store the TD401 in its padded carry case with the desiccant provided. Avoid disassembly beyond battery replacement and goggle detachment – internal components require factory service. Nitrogen purge should be checked every 3 months in storage.

Q5: Is the TD401 waterproof? Can it be used in rain or while wading?

A: The TD401 is not fully submersible but is weather- resistant and designed to operate in rain, snow, and high humidity. The housing is sealed, and the nitrogen purge prevents internal fogging. However, do not intentionally immerse it. After exposure to salt water, wipe the exterior with fresh water and dry thoroughly. For amphibious operations, ensure the objective covers are secure.

Package Contents

Item	Quantity
Main Unit	
TFN TD401 Quad- tube night vision goggle (host)	1 set
Helmet mounting bracket (with flip- up mechanism & low- battery LED)	
External battery pack (with cable and Velcro mounting strip)	
Optical Accessories	
Objective lens cover set (with pinhole)	1 set (4 pcs)
Eyepiece diopter correction caps (standard + optional diopters)	1 set
Power & Cleaning	
AA alkaline battery (1.5V) – for initial setup	4 pcs
Lens brush	1 pc
Lens cleaning cloth (200mm×200mm flannelette)	1 pc
Lens cleaning paper	4 sheets
Storage & Documentation	
Padded hard carrying case (with foam insert)	1 pc
Carrying bag (soft tactical pouch)	1 pc
Silica gel desiccant	1 bag
User manual & maintenance instruction (English + Chinese)	1 copy
Quick start guide	1 copy
Hook- and- loop Velcro (extra pair)	1 pair

Note: Specifications and accessories are subject to change without notice. For the latest configuration, consult your TFN authorized dealer. The TD401 is a restricted export item subject to international arms control regulations.