

HS-4 | Tactical Air Defence | Interceptor Drone |

HS4 Interceptor Drone

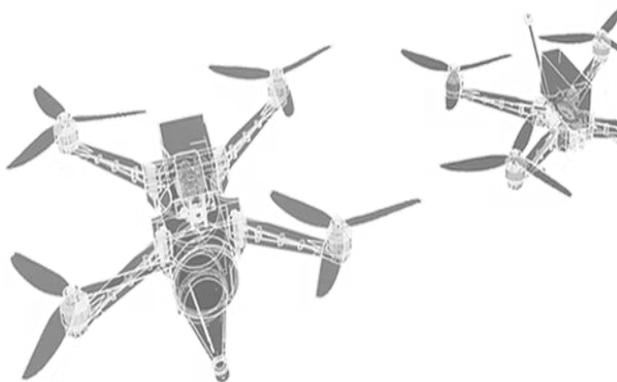
The HS4, developed by Hyllus Systems, is a tactical air defence interceptor drone primarily designed for countering unmanned aerial vehicles (UAVs) such as Shahed-type drones.

It emphasises reactive engagements during the target's cruise phase rather than terminal dives, leveraging operator-guided electro-optical (EO) and infrared (IR) systems for precision targeting.

While not fully autonomous, **it incorporates AI-assisted modes for target detection, tracking, and homing, with manual overrides for safety and control.** The system is resilient to jamming, quick to deploy, and suitable for confined environments, making it ideal for wartime standby operations.

However, **it is optimised for single-interceptor use and lower-speed cruise intercepts, potentially limiting effectiveness against high-speed FPV drones in evasive manoeuvres.**

Overall, the HS4 balances affordability, simplicity, and reliability for short-range air defence, treating the drone as a consumable asset to minimise risks.



Build Frame

- **Model:** Mark4, 10-inch class
- **Type:** X-Quadcopter, carbon fibre construction
- **Propeller size capacity:** up to 10"



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General Performance

Category Specification	Detail
Primary Role	Counter-UAV air defence interceptor, targeting threats like Shahed drones during cruise phase (185 km/h typical). Limited chase capability for high-speed FPV (up to 250 km/h terminal) if first strike misses.
Effective Engagement Range	2–15 km, primarily reactive to inbound threats approaching the operator.
Operational Altitude	Recommended: 200–1,000 m; Capable up to 4,100 m (performance affected by cold/icing); Engagements viable at 1,500 m under suitable conditions.
Guidance System	Operator-guided via high-quality EO/IR cameras; Not GNSS-dependent for terminal guidance (GNSS used only for launch orientation and situational awareness). Vectoring from early warning radars/observers.
Autonomy Modes	<ul style="list-style-type: none"> • Automatic: AI detects and indicates target; Operator confirms before AI takes control for homing. • Manual: Operator selects target via camera; AI locks and flies to intercept. Operator flies drone initially; AI handles tracking/homing post-confirmation; Operator activates detonation near target. Return-to-home (RTH) automatable but discouraged due to risks.
Target Management (Multiple Units)	Typically, one interceptor airborne at a time. For multiples, operators manually select targets (or AI proposes in automatic mode) to avoid engaging the same or friendly units.
Warhead/Ammunition	200–300 g high-explosive (e.g., C4/Semtex); Payload capacity up to 600 g. Fuze: Conventional detonator via JST connector and dedicated board. Safety: Physical pin (removed at launch), arming switch, separate detonation button.
Jamming Resilience	<ul style="list-style-type: none"> • GNSS Jammed: Not mission-critical; Visual guidance continues. • Data Link Jammed: Programmable responses: Stabilise/climb for reconnection, continue preplanned path, or immediate RTH.
Environmental Adaptability	Operates in confined areas (e.g., bushes/trees); Proven in dense foliage tests with control up to 3 km without line-of-sight.
Setup and Readiness	From cold start to launch-ready: ~30 seconds (plug battery, power on for live feed). Designed for 24/7 standby with instant situational awareness.
Safety Protocols	Interceptor treated as consumable (like artillery); Retrieval with live ordnance strongly discouraged due to risks. Layered safeties prevent accidental detonation.

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The HS4 stands out as a pragmatic, operator-centric solution for countering low-to-medium altitude UAV threats in contested environments. **Its strengths lie in rapid deployment—achieving operational readiness in just 30 seconds**—and robustness against electronic warfare, as it sidesteps heavy reliance on GNSS for critical phases.



The integration of AI for target detection and homing adds a layer of semi-autonomy, allowing operators to confirm engagements before the system takes over, which reduces pilot workload while maintaining human oversight for ethical and tactical reasons. **This hybrid approach is particularly effective for head-on or rear-chase intercepts during a drone's cruise speed, where the HS4's design excels, boasting high hit probabilities in real-world scenarios like those in Ukraine.**

Camera Options

Type	Detail
EO (Low-Light Color)	FS – 1080p, f/2.0, ~0.01 lux sensitivity
EO (Starlight/HDR)	GZR– 2–5 MP, WDR 120 dB+, 0.001 lux
EO (Enhanced Low-Light)	R-PRO – 4–8 MP, F1.0, 0.0005 lux full-colour
IR (B/W Night Vision)	INFRA – 1080p with 850 nm LEDs, 30–80 m range, 0 lux
IR (Thermal)	TC256 (256×192, NETD ≤40 mK), TC384 (384×288), TC640 (640×512, 60 fps, FOV 48.3°×38.6°)

Video Transmission

System	D04 Air Unit Pro
	Digital HD video system, integrated with D-Goggles 2 / Integra.
	Supports 1080p @ 100 fps low-latency video.
	Range up to 15 km (FCC) with strong anti-interference performance.
	Integrated OSD and telemetry overlay from AP.
	Advantages: ultra-low latency (<50 ms), crystal-clear HD feed, high penetration compared to older systems, and stable connection even in challenging RF conditions.



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HS4 Interceptor Drone - Summary

The HS4 is best suited for small-scale defences rather than swarm countermeasures. The camera suite is impressive, offering versatile EO/IR options for day/night/low-light conditions, with thermal variants providing excellent detection in adverse weather.

Safety features are comprehensive, and the "consumable" philosophy underscores possible risks in ordnance handling, advising against RTH with live payloads.

In summary, the HS4 is a cost-effective, field-proven tool for asymmetric air defence, ideal for frontline units needing quick, reliable intercepts without complex infrastructure. It bridges manual piloting with AI assistance effectively, but users should temper expectations for ultra-high-speed or autonomous swarm scenarios, where more advanced platforms might be required. Based on the provided details, it appears well-tailored for current conflict zones like Ukraine, prioritising simplicity and survivability.



Client Operating Set-Up

Use	3 rd Party Equipment
Operating with UAV	DJI Googles 3
	GX12 Dual-Band Gemini-X Radio Controller (M2)
	Laptop Windows/Mac-OS or phone IOS/Android to run QGroundControl



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