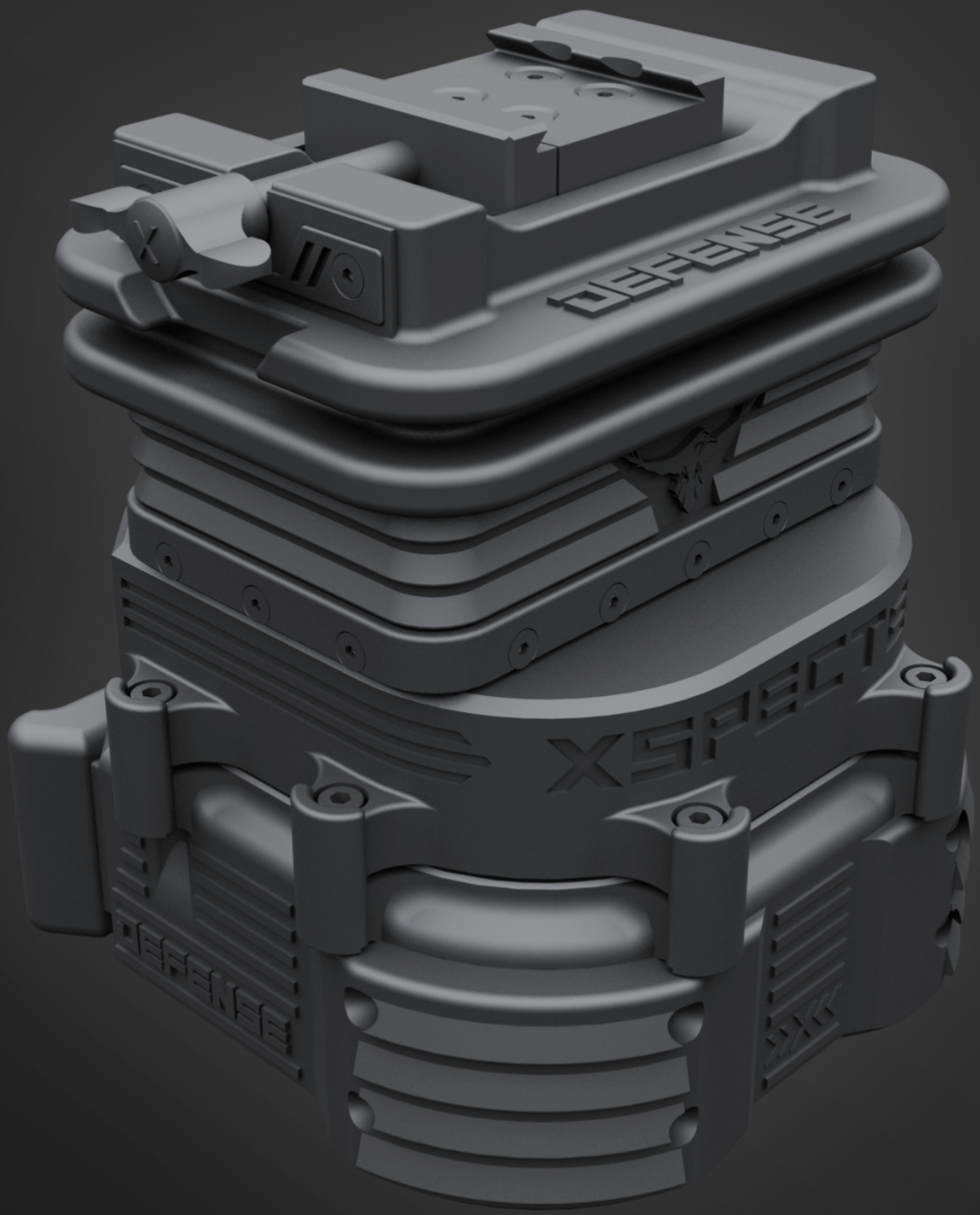
TCROW

DEFENSE MUNIN

MPO: 6760-01086



XSPECTER®

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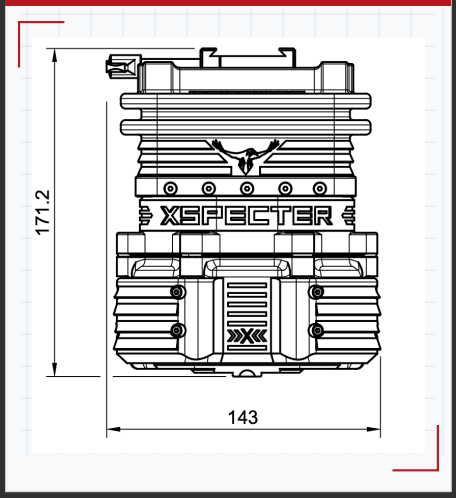
MOBILE PAN-TILT SYSTEM

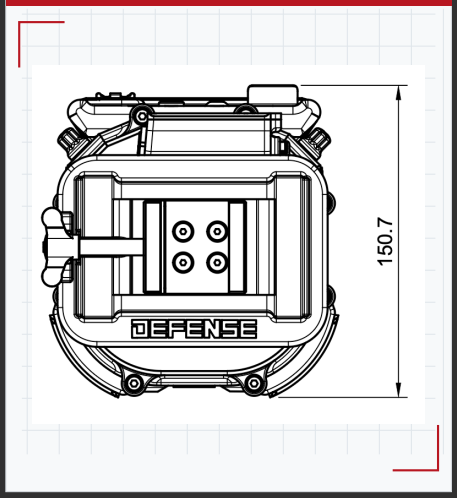
BASELINE: 31 AUGUST 2026

TECHNICAL DATA

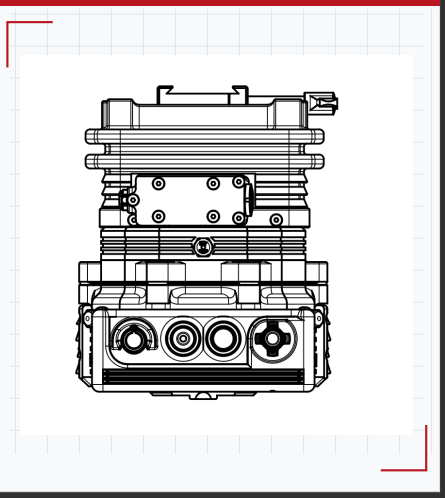
01 / FRONT



02 / TOP



03 / REAR



ICD engineering views | Dimensions in mm | Not to scale

DEFENSE MUNIN

PAYLOAD	max. 6.5 kg
DIMENSIONS	143 × 150.7 × 171.2 mm without feet
WEIGHT	2.2 kg without feet / 3.0 kg with feet
PAN / TILT	360° continuous, unlimited / -35° to +35°
NOMINAL SLEW RATE	Pan: approx. 59.3°/s / Tilt: approx. 73.6°/s No-load values
DRIVE	Brushless DC servo motors with Hall sensors
POWER INPUT	5 V DC via USB; 9-36 V DC / VBAT*
BATTERY	Integrated 5,000 mAh lithium battery; 3-8 h
POWER CONSUMPTION	< 35 W operating / < 10 W standby
INTERFACES	Gigabit Ethernet, USB, dual-band 2.4/5 GHz Wi-Fi, Nett Warrior
PROTOCOLS	UART, TCP/IP, RTSP, REST API
CONNECTORS	Glenair Mighty Mouse Series 807 STANAG 4695
MOUNTING	Magnetic feet, suction feet, tripod; camera quick-release adapter

* The ICD specifies 9-36 V DC for VBAT compatibility and 10-36 V for the Nett Warrior connector. Confirm the input range for the selected connection and power configuration.

PRECISION & ENVIRONMENT

PAN / TILT PERFORMANCE

PARAMETER	PAN / YAW	TILT
POSITIONING ACCURACY[1]	±0.019°	±0.040°
THEORETICAL RESOLUTION[2]	approx. 0.0097°/step	approx. 0.0240°/step
NATO MIL / STEP[2]	approx. 0.17	approx. 0.43
STEPS / DEGREE[2]	approx. 103.5	approx. 41.8
STEPS / NATO MIL[2]	approx. 5.8	approx. 2.35
NO-LOAD SLEW RATE[2]	approx. 59.3°/s	approx. 73.6°/s
NO-LOAD RATE, NATO MIL/S[2]	approx. 1,055	approx. 1,308
MOTOR SPEED / GEAR RATIO[2]	90 rpm / 9.1:1	45 rpm / 3.67:1

[1] Positioning accuracy as stated in the supplied April 2026 datasheet; test conditions are not specified.
[2] Theoretical resolution and nominal no-load values from ICD v0.4. Resolution is not positioning accuracy. The April sheet also lists 0.1-120°/s; this range is not substituted for the later ICD axis-specific rates.

ENVIRONMENT, MATERIALS & COMPLIANCE

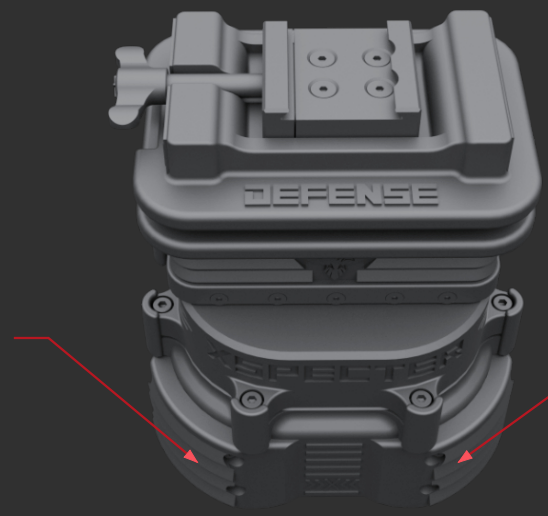
OPERATING TEMPERATURE	-20 °C to +70 °C
HUMIDITY	95%, non-condensing
INGRESS PROTECTION	IP67; optional IP68 via potted housing parts
SALT FOG	Cerakote coating; target ≥ 480 h NSS according to DIN EN ISO 9227
MATERIALS	SLS PA12 / PA11-CF; aluminium 7075-T6; V4A stainless steel; CuZn39Pb3 gears
SHOCK PROTECTION	TPU 90 reinforcement of high-stress parts
EMC / RADIO REFERENCES	2014/30/EU and 2014/53/EU (as listed in ICD)

Environmental ratings and compliance references reflect the ICD specification; this datasheet does not add independent test or certification claims. Motor precision and travel angles may be tailored to customer requirements.

VIEWS & CONNECTIONS

Renderings from the supplied design reference. Functional labels follow the ICD; concealed connections are marked accordingly. Illustrations are not to scale.

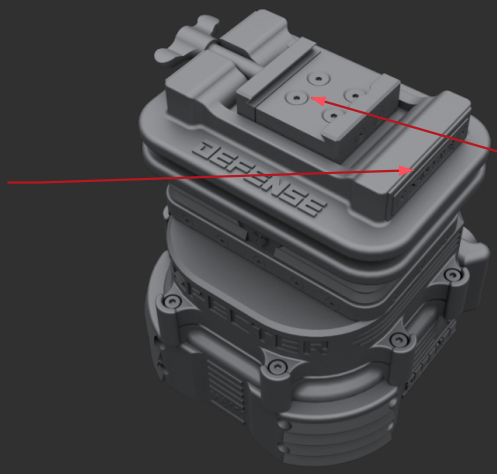
01 / FRONT & BACKUP CONNECTIONS



Backup USB-C beneath cover

Backup Ethernet beneath cover

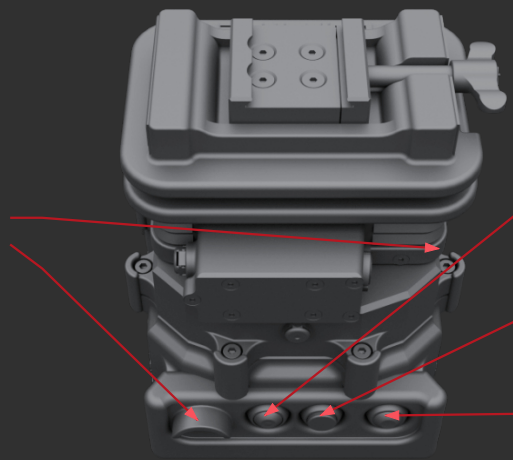
02 / CAMERA INTERFACE



Wi-Fi antennas at head sides

Camera quick-release adapter

03 / CONTROL & POWER



Nett Warrior head / base (partly concealed)

On/off button

Mode button

Battery kill switch

C4ISR & SYSTEM INTEGRATION

GLENAIR STAR-PAN INTEGRATION

Integration with Glenair STAR-PAN is shown in the supplied system configuration: a tactical power and data hub connecting MUNIN, an EUD and an external battery.

C4ISR: Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance. MUNIN supports integration into this ecosystem through remote pan-tilt control, optronics interfaces and live video. The source describes C4I-capable interfaces, not a blanket C4ISR certification.

CONTROL & DATA

XSPECTER App for iOS / Android and web dashboard. Wired or wireless remote operation and real-time image/video streaming.

Integrated mini-computer for image processing and encoding; MediaMTX for non-RTSP streams.

Camera APIs for focus, zoom, recording, palettes and LRF functions where supported. Scope defined per device.

COMPATIBILITY & OPTIONS

STAR-PAN integration depends on the selected hub, cable set, power routing and host configuration. Confirm the project-specific interface setup.

Optional 4G/5G VPN, BMS integration, external AI modules, detection and tracking.

Project-specific integrations may include Canon, Safran Mosquito TI, JIM Compact, Nightwolf and Zippermast.

EXAMPLE DELIVERY PACKAGE

TCROW MUNIN pan-tilt carrier
15 m Glenair cable set
EUD connection cable set
Camera Y-adapter and controller as specified
Magnetic / suction mounting kit
Tripod mount and camera quick release
Mounting tool and transport case with inlay
XSPECTER App / software package
EUD tablet and other items as agreed
Final delivery scope is project-specific

NETT WARRIOR PIN ASSIGNMENT (ICD)

1 VBAT / black	Battery positive
2 GND / yellow	Common ground
3 VBUS / red	USB power
4 D+ / green; 5 D- / white	USB data + / -
6 reserved / blue	Reserved

Sources: ICD TCROW MUNIN v0.4, 31 August 2026; supplied XSPECTER technical datasheet, April 2026 (renderings, positioning accuracy and example STAR-PAN configuration). Specifications and options are configuration-dependent and subject to change.