
Czechia
Systems
MURMUS
Mobile, dual-use counter-drone complex.
Detect it early. Stop it for less.
Developed by Czechia Systems a. s.
Member of S-TECH GROUP

Cheap drones changed the fight. MURMUS is built for it.

The problem

Drones that cost a few hundred euros now threaten troops, command posts, airfields, power plants and airports. Jamming alone no longer stops them, missiles cost more than the targets they hit, and the threat changes faster than a tender runs.

Our answer

One mobile complex that finds the drone, helps the operator decide and stops it: jam or spoof first, intercept when that is not enough. A person authorises every engagement. Everything comes under one contract, from one integrator.

1+2
Vehicles in one set: command vehicle and two launch vehicles

80+
Effector drones ready to launch in a standard set

12.5 km
Radar counter-drone range, 5.3–12.5 km by target size

350 km/h
Interceptor speed, 20 km effective range

Eight reasons to choose it.

01 **Where jamming isn't enough**
Fibre-optic and preprogrammed drones ignore jammers. MURMUS stops them physically with an interceptor.

02 **Jam and spoof first**
Radio- and satellite-guided drones are stopped without firing a shot. Hard kill only when needed.

03 **The operator decides**
The system proposes, a person authorises every engagement and can abort at any moment.

04 **Sees without being seen**
Passive RF sensing finds the drone and its pilot while emitting nothing.

05 **Mobile, no infrastructure**
Off-road 4×4 vehicles. Drive in, set up, protect, move on.

06 **Low-profile in peacetime**
Civilian-style vehicles stay unobtrusive and don't alarm the public around protected sites.

07 **Affordable per shot**
Each effector costs less than the drone it stops. No burning missiles on cheap targets.

08 **One contract**
System, crew training, licences, service and annual effector upgrades. One number to call.

Who is this for

One complex.
Three kinds of customer.

Armed forces

Protects convoys, command posts, airfields and borders on the move.

- Full sensor suite, jamming, spoofing and hard kill
- Many complexes share one air picture
- Crews trained and certified before delivery

Ministries and procurement

A complete capability, not a kit of parts to integrate.

- One contract, one accountable team
- Export-documented, licences kept current
- Up to 5-year lifecycle with annual upgrades

Critical infrastructure

Energy, airports, industry and logistics sites.

- Detection and jamming for the lower tier
- Low-profile vehicles that don't alarm the public
- Hard kill only where the law allows it

Tier	All sensors	Jamming – Spoofing	Hard kill
Armed forces – medium and lower tier	✓	✓	✓
Critical infrastructure – lower tier	✓	✓	when EU law allows



Mobile, dual-use counter-drone complex

How it works

Detect. Decide. Defeat.

01

Detect

Radar, radio, cameras and microphones spot the drone early, day and night.

02

Classify

The software merges all sensors into one track and tells what kind of object it is.

03

Track & propose

It predicts the flight path, rates the danger and proposes the best response.

04

Neutralize

The operator authorises: jam or spoof first, launch an effector if needed.

The standard 1+2 set

Command and Control Vehicle (C2V) carries the sensors, the decision software and up to three operators. It also jams and launches its own effectors.

Two Effector Launch Vehicles (ELV) carry 30+ effector drones each and launch on target data from the C2V. Start with one set, add more under one command as the mission grows.

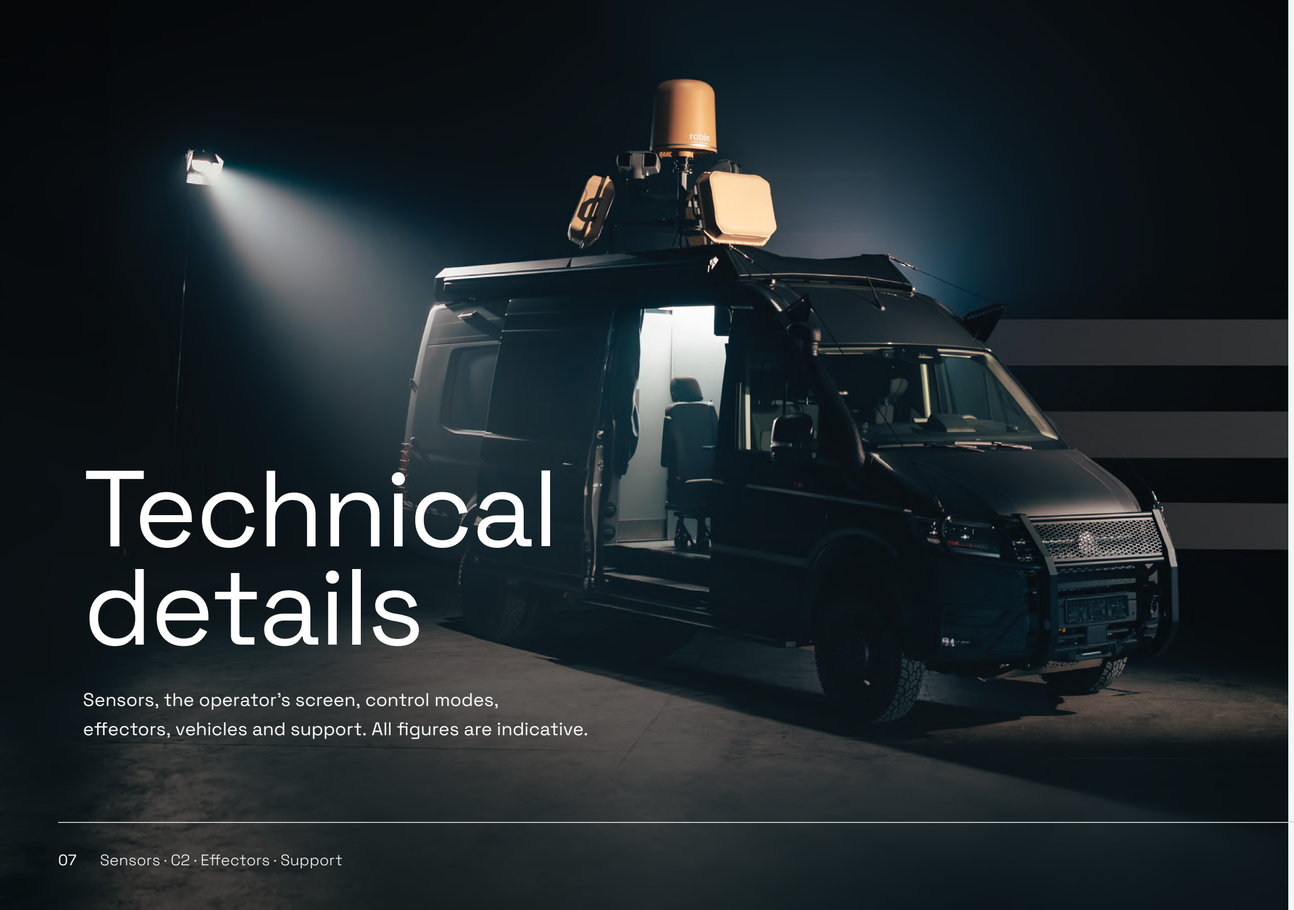
Layered response

The right tool for each drone.

No single method stops every drone. MURMUS layers soft kill and hard kill so that nothing slips through the gap between them.

Threat	Soft kill – Jam, Spoof	Jamming – Spoofing
Commercial and FPV drones on a radio link	✓ jamming	✓
Drones navigating by satellite · GPS, Galileo	✓ spoofing	✓
Fibre-optic FPV · no radio link	nothing to jam	interceptor
One-way attack drones · pre-programmed	nothing to jam	interceptor
Mass attack · 2–3 effectors per target	–	planned for 2027

Always in this order: the system cues, the operator authorises. Jamming and spoofing are used where the law allows radio interference.



Technical details

Sensors, the operator's screen, control modes, effectors, vehicles and support. All figures are indicative.

Detect

Four senses. One picture.

01

EO / IR cameras

Day and thermal cameras confirm the target and feed terminal guidance.

02

Passive RF

Finds the drone and its pilot, tells its type and points the jammer. Emits nothing.

03

4D radar

Finds drones that stay silent. Range, bearing, height and speed of every track.

04

Acoustic

Hears engines and propellers at short range, covering low-flying drones near the site.

Radar type	Pulse-Doppler 4D, software-defined, electronically scanned	**C-UAS range**	5.3–12.5 km · vehicles > 12.5 km
Frequency	Ku-band 15.4–16.6 GHz	**Tracks**	> 1,000 simultaneous
Field of view	130° azimuth × 90° elevation	**Update · accuracy**	10 Hz · < 0.5° elevation

Classify & Track — Operator view

What the operator sees.

No single method stops every drone. MURMUS layers soft kill and hard kill so that nothing slips through the gap between them.

1 Detect

Radar and passive RF sensors pick up the drone kilometres away. It becomes a live track: position, height, speed and time to the protected zone.

2 Fuse

Radar, RF, day and thermal cameras and acoustic sensors merge into one track per drone. The panel shows which sensors confirm it.

3 Classify

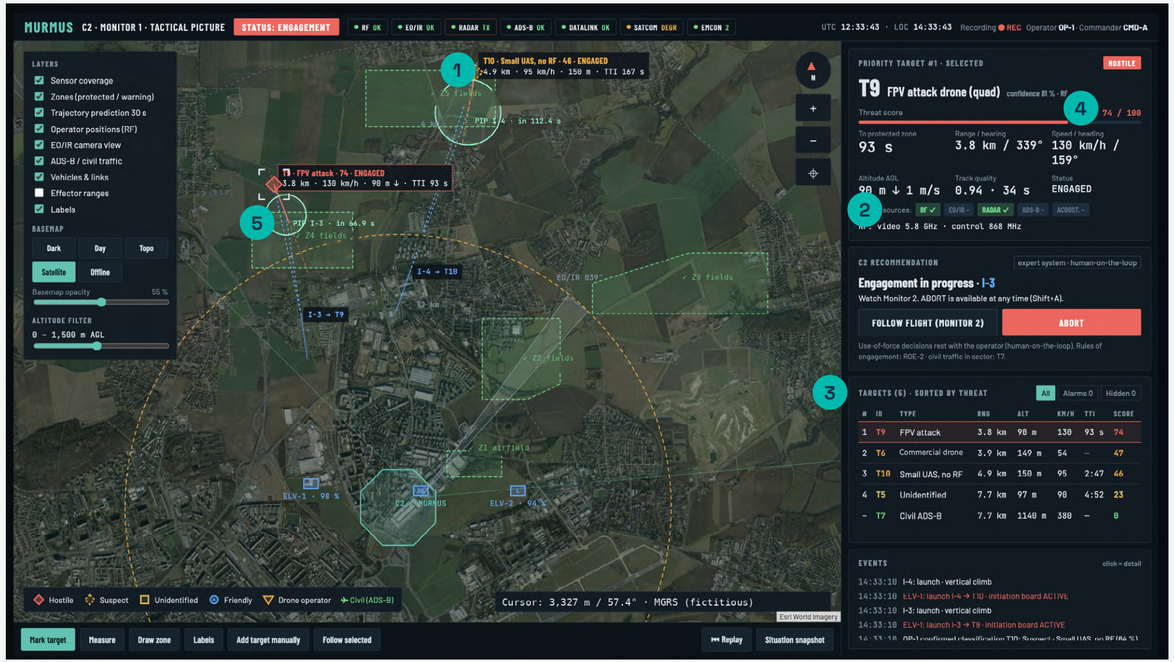
The system sorts the object into a category, such as attack FPV, commercial drone or civil aircraft, and shows how sure it is. Cameras confirm at close range.

4 Assess

Rule-based scoring rates each threat from 0 to 100, predicts its flight path and puts the most urgent at the top.

5 Engage

A person authorises every engagement. The effector's flight and intercept point update live, and the operator can abort at any moment.



Decide – Control modes

The system proposes. The operator decides.

Manual

The pilot flies the mission on C2 target data, with an FPV view in the last mile.

Semi-automatic

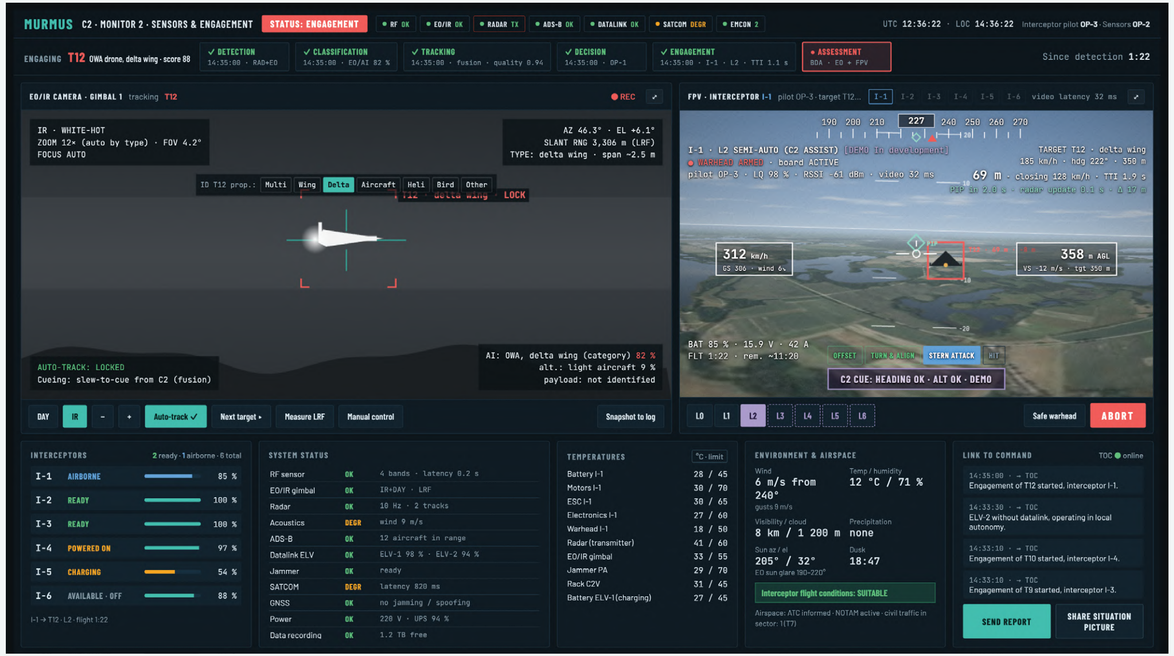
C2 plans the route, computer vision guides the final approach. The operator launches and confirms.

Fully autonomous

C2 re-plans live with autonomous terminal guidance. The operator supervises, authorises and can abort.

Movement	speed, altitude, heading, manoeuvres
Emissions	radio pattern, Remote ID, ADS-B
Imagery · sound	day camera, thermal, acoustic signature
Context	behaviour toward the protected area

Every proposal shows its confidence and evidence and can be confirmed, changed or aborted. Rules of engagement and geofences are built in. AI classification is in development, with testing and deployment in 2027. Mode 3 without human confirmation is not deployable in CZ/EU for peacetime protection of civil critical infrastructure.



Classify & track – Architecture

Six layers. One decision.

1 Sensing
Multi-domain

RF · 4D radar · EO camera · IR camera · Acoustic · External data

Sees and hears every object in the airspace.

2 Fusion
Common picture

Time and geo alignment · Multi-source tracks · Confidence per track

Merges all sensors into one track per object.

3 AI Analytics
Predict

Classification · Threat scoring · Trajectory · Explainable output

Classifies, scores and predicts each track.

4 C2 Decision
Human–AI teaming

Rules, geofences · AI recommendation · Operator: approve · modify · abort

Proposes the response; the operator decides.

5 Effectors
Neutralize

Effector drones · Jamming, spoofing · Result back to C2

Jams, spoofs or engages the target.

6 Data
Learn, improve

Recordings · Incident replay · Training, simulation · Model improvement

Records engagements to improve the system.

Foundation: cybersecurity · degraded-mode operation · safety assurance · CZ / EU / NATO compliance · integration layer: SAPIENT, ASTERIX, JREAP-C, STANAG, API adapters (p.15). Dashed = planned.

C2 – Networked

Many complexes. One picture.

C4 mode
Federated picture

Several complexes and external sensor feeds in one air picture

Complex 1
Own C2, sensors, effectors

Complex 2
Own C2, sensors, effectors

Complex n
Own C2, sensors, effectors

Local autonomy

Each complex keeps fighting on its own if the links drop.

Failover

A neighbouring complex takes over tracks and tasks.

Track handover

A track passes from complex to complex without a gap.

Shared effectors

The best-positioned available effector engages the target, regardless of which complex it belongs to.

Integration layer

Interface	Purpose
SAPIENT	Sensor to C2 data exchange
ASTERIX	Radar and surveillance data
JREAP-C	Link 16 over IP to allied C2
STANAG family	Allied interoperability
API, adapters	Third-party sensors, effectors, site security

Layered response today:
the C2V jams first; if that is not enough, effectors engage from the vehicles of the set. Mass-attack handling (2–3 effectors per target) is planned for 2027.

Neutralize – Soft kill

Jam it, spoof it and, if needed, escalate.

Jamming

Drowns the radio link between the drone and its pilot. The drone loses commands or video and falls back to return, land or hover.

Targets	control link, video link
Emissions	wideband, spot, sweep, reactive

Spoofing

Feeds the drone false satellite-navigation signals. Its autopilot loses its true position and drifts off route or falls back to failsafe.

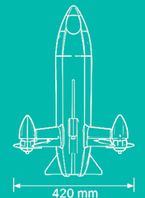
Targets	GPS, Galileo, GLONASS
Works on	Satellite-navigated drones

Where soft kill stops

Fibre-optic FPV has no radio link. Pre-programmed drones have nothing to jam once launched. That is why MURMUS pairs soft kill with hard-kill effectors.

The passive RF sensor points the jammer at the active link; the operator authorises. Used where the law allows radio interference.

One C2. A family of effectors.

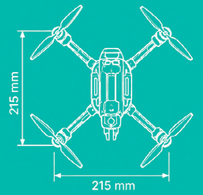


Available

Interceptor

VTOL hard kill

350 km/h
Range 20 km
4 electric motors
Details on p.19

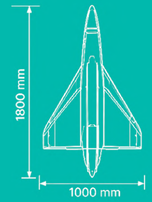


Available

FPV multirotor

7-inch, high speed

200+ km/h
Range 10 km
Flight time 15 min
Payload 0.3 kg

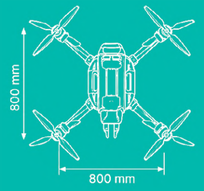


Concept

Fixed-wing

High speed, loitering

600–800 km/h
Range 20 km
Ceiling 10 km
Catapult launch

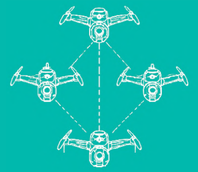


On demand

Net capture

Non-kinetic

Deployable net
Small UAV targets
Coaxial X8, 80 × 80 cm
Partner solution



In development

Networked group

Cooperative flight

2–20+ FPV units
Ad-hoc mesh link
Search · track · engage

C2 recommends, the operator authorises.

The effector is chosen by target type, risk, distance and assets available. Soft kill on p.16.
Figures for the FPV multirotor, fixed-wing and networked group are design targets, not measured values.

Neutralise — Interceptor

Rapid response. Targeted strike.

Hard kill for FPV, fibre-optic FPV and one-way attack drones, cued by C2 and shown live in May and June 2026. The operator authorises every engagement.

Max speed	350 km/h	**Effective range**	20 km
Max altitude	6,000 m	**Endurance**	15 min
Payload	500 g		
Guidance	Manual FPV today; autonomous terminal guidance in development		

EU-made warhead

Made and integrated in the EU by a munitions supplier with 30+ years in the industry, own certified storage and full export documentation.

Indicative

Subject to final configuration, environmental conditions and engineering validation. No guarantee of operational outcome.

Thermal camera onboard.

Picks up the target's heat signature by day and night, through haze and smoke, and feeds the pilot view and terminal guidance.

Deploy – the vehicles

Command on wheels. Launch on the move.





C2V · Command and Control Vehicle

Operators	3 workstations, dual 27" monitors
Sensors	passive RF, EO/IR, 4D radar, acoustic
Effectors	20+ own effectors, jammer
Link · power	tactical radio, satellite, 220 V, A/C

ELV · Effector Launch Vehicle

Effectors	30+ interceptors, FPV and other drones
Operators	2 workstations, dual 27" monitors
Launch	Mobile launch platforms
Link · power	Real-time C2 link, satellite 220 V, A/C

Common heavy-duty 4×4 platform: locking differentials, reinforced suspension, raised clearance, snorkel. Civilian-style, low-profile in peacetime. Effector numbers depend on fit-out and effector type.

DEPLOY & SUPPORT

One contract.
Up to 5 years lifecycle.

Crew training

Operators certified to full capability before delivery, then up to advanced scenarios.

Service

Maintenance and support for the full contract. One number, one team, SLA-defined response.

Upgrades

Software and hardware upgrades as the system evolves,including an effector upgrade every year.

Licensing

All certifications and licences kept current for the whole contract.

No fixed limits

Start with one 1+2 set and scale to many under one C2. Each complex keeps working on its own if links drop; a neighbour takes over its tracks.



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EMPOWERING EUROPEAN RESILIENCE

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Contact:

www.czechiasystems.com info@czechiasystems.com

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