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MQ 02

MUNICIPAL BACKPACK

Inspection, monitoring and security system for local authorities

Technical data

Manoïd robot model: MQ02

Dimensions: 820 × 430 × 570 mm

Weight: 50 kg

Autonomy: up to 2.5 hours

Protection rating: IP66 (MQ02) and IP65 (Backpack)

Payload: 15 kg

Operating temperature: -20°C to +55°C

Navigation: advanced autonomous

Embedded AI: Vision Sentinel AI, NIS2 security, no cloud

Not ATEX certified

ADVANTAGES

- All-terrain capability
- Agility
- Precision
- Autonomy
- Improved predictive actions through detailed and comparative mapping

Embedded equipment & sensors

- Beacon light + loudspeaker + microphone + floodlight (4-in-1)
- 4K HD day/night camera — visual inspection
- IR thermal camera — façades, vegetation, fire detection
- 360° fisheye camera — perimeter surveillance
- 3D LiDAR — mapping, digital twins, SLAM
- RTK GPS (2 cm accuracy) — automatic georeferencing, real-time GIS
- Multi-gas detection (H_2S, CO, CH_4, O_2, VOCs) — sewers, confined spaces
- 4G/5G + Wi-Fi + LoRa connectivity (remote areas)2 TB SSD — mission archiving / insurance evidence

MISSIONS

Number of missions : 47

(identified during a general case study for a local authority with full competencies — non-exhaustive number — full list available overleaf. Additional studies available upon quotation)

Specific domains : 8

- Roads and networks
- Road signage
- Green spaces
- Built heritage
- Security
- Municipal police
- Civil protection
- Data and GIS (Geographic Information System)

99.7%	3X	IP65 / 67	47	<18 mois
inspection accuracy	faster detection	Protection	Identified missions	Typical ROI

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DUXOGROUP

ROADS & NETWORKS — 14 missions

1. Visual inspection of road surfaces (cracks, ruts, potholes, subsidence)
2. Surface thermography — detection of voids beneath asphalt
3. Road marking inspection (condition, retroreflectivity)
4. Inspection of pavements and kerbs (condition, accessibility for reduced mobility users)
5. Inspection of gutters, channels, ditches and drains
6. Inspection of engineering structures — bridges and footbridges (NI 1979)
7. Inspection of retaining walls and hydraulic culverts
8. GIS inventory of covers, manholes and cable chambers
9. Detection of surface water leaks (abnormal moisture, thermal anomalies)
10. Identification and condition of fire hydrants and shut-off valves
11. Inspection of internal sewer networks (3D LiDAR, cavities)
12. Gas detection in networks (H_2S, CO, CH_4, O_2)
13. Inventory and inspection of public lighting (failures, poles, corrosion)
14. Ground photometric measurements (light output, compliance)

GREEN SPACES & ENVIRONMENT — 9 missions

15. Health inspection of roadside trees (diseases, fungi, dead branches)
16. NDVI vegetation vigour measurement (multispectral camera)
17. Detection of invasive plants (Japanese knotweed, ragweed)
18. Inspection and compliance of playgrounds (NF EN 1176, anti-vandalism)
19. Inspection of street furniture (benches, bins, bus shelters, fountains)
20. Cemetery monitoring (subsidence, vandalism, boundary walls)
21. Monitoring of public watercourses (flow, level, banks)
22. Monitoring wetlands and municipal natural environments
23. Detection of illegal dumping in natural areas

BUILT HERITAGE — 9 missions

24. Thermal inspection of public building façades (heat loss, infiltration, thermal bridges)
25. Inspection of pavements and pedestrian/cobbled streets
26. 3D LiDAR mapping of built heritage (digital twins)
27. Inspection of municipal historical monuments (crosses, fountains, washhouses)
28. Detection of deterioration on sculptures and heritage inscriptions
29. Night patrol of school perimeters (intrusions, fencing, gates)
30. Inspection of playgrounds and school surroundings
31. Inspection of outdoor sports facilities (stadiums, gyms, fencing)
32. Monitoring and inspection of outdoor swimming pools (pool decks, surroundings)

SECURITY & MUNICIPAL POLICE — 7 missions

33. Autonomous night patrols of sensitive areas (car parks, parks, commercial zones)
34. Perimeter patrol of municipal sites and depots
35. Monitoring pedestrian areas, markets and fairs
36. Patrol of school surroundings (arrival and departure times)
37. Perimeter reconnaissance before events (security, abandoned objects)
38. Intrusion detection outside public park opening hours
39. Monitoring illegal postings and public space degradation

PREVENTION & CIVIL PROTECTION — 5 missions

40. Monitoring rivers during floods (level, speed, alerts)
41. Real-time mapping of flooded areas (LiDAR, RTK GPS)
42. Post-incident inspection (damage, blocked roads, inaccessible areas)
43. Monitoring municipal forests (early fire detection — IR thermal)
44. Pre-intervention reconnaissance for emergency services (collapsed areas, HAZMAT)

DATA & CROSS-FUNCTIONAL GIS — 3 missions

45. Creation and automatic updating of the Municipal Asset Register
46. Production of time-stamped inspection reports (legal evidence, audit)

Feeding inter-municipal dashboards and digital twins