

Edge Perception Hardware for Autonomous and Safety-Critical Maritime Operations

A hardware partner seeking a consortium — not a project of our own

Kuantek Elektronik A.Ş. · Bilişim Vadisi, Gebze, Türkiye

HORIZON-CL5-2027-03-D5-16

Autonomous vessels in short sea shipping and inland waterways

HORIZON-CL5-2027-03-D5-06

Fire prevention and mitigation for EVs in confined areas

Two calls, one missing layer

D5-16 · AUTONOMOUS VESSELS

Perception that survives night, fog and glare

Autonomous navigation in short sea and inland waterways depends on situational awareness that does not fail at night or in poor visibility. Visible-band cameras degrade in darkness. Radar detects but classifies poorly. Thermal imaging is passive and unaffected by light — but today it is fused late, in software, after each band has run its own pipeline.

D5-06 · FIRE IN CONFINED AREAS

Detection before flame, not after

Battery fires on car decks, in ferry garages and in enclosed parking begin as a thermal event that precedes flame and smoke. Conventional detection responds once propagation is already under way. Thermal imaging with inference running on the sensor moves detection earlier — provided the processing sits next to the camera.

Both problems reduce to the same engineering question: where does the fusion and the inference actually run?

What we bring to the hardware work package

1

Multi-band sensing front-end

LWIR and visible-band camera cores, lens–detector matching, and range performance modelling against the Johnson criteria.

2

Early fusion implemented on FPGA

Pixel- and feature-level fusion ahead of detection, with hardware-level sensor synchronisation and inter-band registration.

3

Deterministic, measured latency

Sub-frame timing characterised through an FPGA-internal trigger methodology — figures we can demonstrate rather than assert.

4

Integration and demonstrator hardware

Modbus, CAN and EtherCAT interfaces; demonstrator units built and supported for shipboard and terminal pilot campaigns.

Why this is credible

32+

national R&D project applications
submitted

14

R&D projects completed

8

carried through to commercialised
products

- Authorised Efinix FPGA distributor for Türkiye — direct silicon vendor access for the consortium.
- Electro-optical system engineering: LWIR sensor and optics specification, detection range analysis, latency characterisation.
- High-channel-count acquisition and real-time signal processing, including a 48-channel sonar front-end on Efinix FPGA.
- Founded by academic engineers; working relationship with Kocaeli University's Electronics and Communications Engineering department.

What we are asking for

Our role in the consortium

- Lead of a sensing and edge-processing work package
- Supplier of demonstrator hardware for pilots
- Contributor to system integration and field validation
- Not a coordinator — we join, we do not lead the proposal

Partners we are looking for

- Coordinators forming consortia for D5-16 or D5-06
- Perception and autonomy algorithm groups
- Vessel, ferry and terminal operators for pilot sites
- Test infrastructure, datasets and certification expertise

Assoc. Prof. Dr. Anıl Çelebi — Managing Partner, Kuantek Elektronik A.Ş. · Kocaeli University

Request a bilateral meeting on the ICTürkiye2026 platform — matchmaking stays open into Q1 2027.