INDUSTRIAL GAS · IIoT ECOSYSTEMS

One IIoT EcoSystem for Gas Networks.

From field sensors to the Enterprise IoT Platform —
one integrated stack for next-generation gas networks.

CONTEXT · WHY NOW

The gas grid is being re-instrumented.

Three global forces are reshaping how operators run, report and secure gas networks.

DECARBONISATION

01

Methane emission monitoring

Operator-level methane reporting is becoming mandatory across jurisdictions — EU Methane Regulation 2024/1787, US Methane Emissions Reduction Program (IRA), and the Global Methane Pledge partners.

CYBERSECURITY

02

Critical-infrastructure baseline

Gas DSOs and TSOs are classified as essential entities. NIS2 in the EU, NERC-CIP in the US, and sector-specific directives worldwide require auditable controls and incident reporting.

SMART METERING

03

AMR rollout acceleration

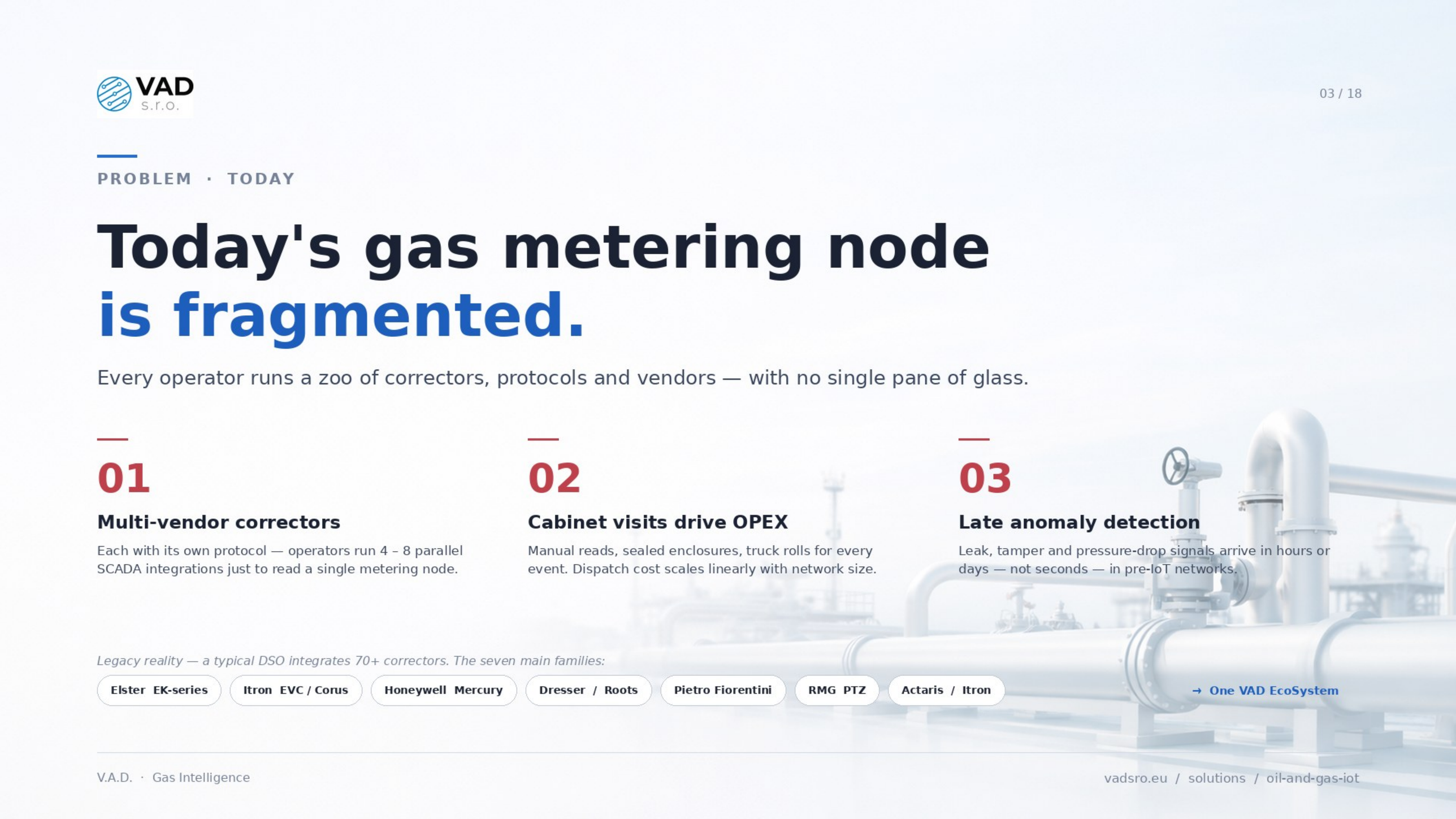
National AMR programmes are scaling across EU, MENA and Asia. Legacy heterogeneous correctors and meters demand a single unified telemetry layer — and an AI-driven analytics backbone.

Three forces. One platform. One stack.

PROBLEM · TODAY

Today's gas metering node is fragmented.

Every operator runs a zoo of correctors, protocols and vendors — with no single pane of glass.



01

Multi-vendor correctors

Each with its own protocol — operators run 4 – 8 parallel SCADA integrations just to read a single metering node.

02

Cabinet visits drive OPEX

Manual reads, sealed enclosures, truck rolls for every event. Dispatch cost scales linearly with network size.

03

Late anomaly detection

Leak, tamper and pressure-drop signals arrive in hours or days — not seconds — in pre-IoT networks.

Legacy reality — a typical DSO integrates 70+ correctors. The seven main families:

Elster EK-series · Itron EVC / Corus · Honeywell Mercury · Dresser / Roots · Pietro Fiorentini · RMG PTZ · Actaris / Itron

→ One VAD EcoSystem

OUTCOME · TARGET STATE

Three outcomes a modern DSO expects.

From fragmented operations to unified control — measurable in days, not years.

1 console

Unified telemetry

One operator console for every cabinet, every protocol — across 70+ supported correctors and all four VAD controllers.

≤ 90 sec

Anomaly → valve-close

Remote actuation with operator confirmation and a complete audit trail. Event-driven, not schedule-driven.

−35 %

Manual cabinet visits

After full ValveLink + EIP rollout. Truck rolls replaced with targeted dispatch — only when physical intervention is required.

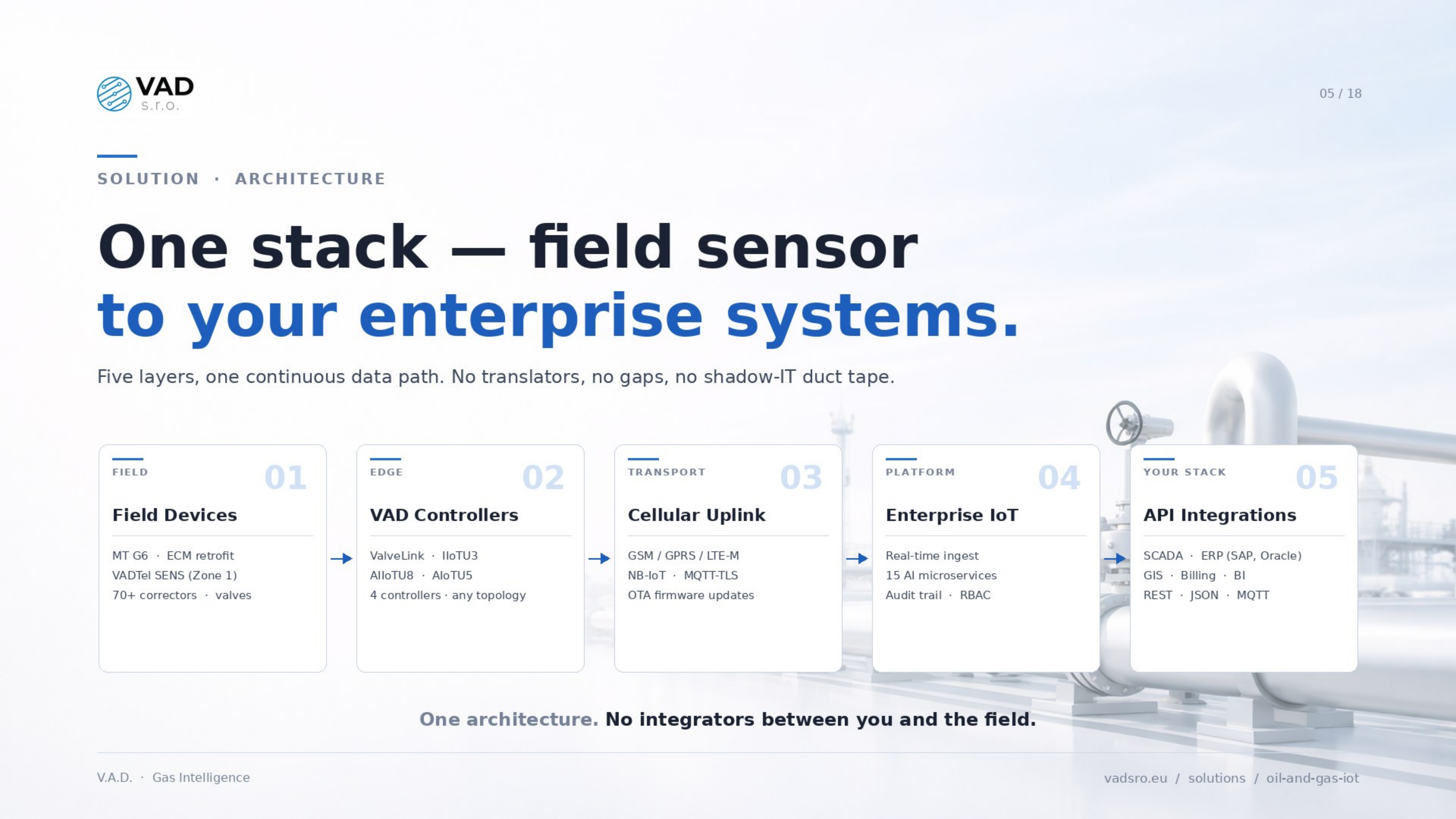
Metrics shown are pilot-derived, 12-month window. Operator-specific results depend on deployment scope and network topology.

From fragmented. To unified. To measurable.

SOLUTION · ARCHITECTURE

One stack — field sensor to your enterprise systems.

Five layers, one continuous data path. No translators, no gaps, no shadow-IT duct tape.



FIELD 01

Field Devices

MT G6 · ECM retrofit
VADTel SENS (Zone 1)
70+ correctors · valves

→

EDGE 02

VAD Controllers

ValveLink · IIoTU3
AIIoTU8 · AIoTU5
4 controllers · any topology

→

TRANSPORT 03

Cellular Uplink

GSM / GPRS / LTE-M
NB-IoT · MQTT-TLS
OTA firmware updates

→

PLATFORM 04

Enterprise IoT

Real-time ingest
15 AI microservices
Audit trail · RBAC

→

YOUR STACK 05

API Integrations

SCADA · ERP (SAP, Oracle)
GIS · Billing · BI
REST · JSON · MQTT

One architecture. No integrators between you and the field.

CONTROLLER · FAMILY

Four controllers, one platform — for every gas-network topology.

CABINET CONTROLLER

VADTel-IIoTu-ValveLink

P/N VAD-IIOTU-VLK-01

- Mains 12–24 V DC, 15 W max
- In-cabinet installation (non-Ex)
- GPRS / NB-IoT · RS-485

The only unit with valve actuator outputs. Cellular telemetry, isolated RS-485, cabinet supervision.

INDUSTRIAL IoT UNIT

VADTel IIoTU3

- Mains powered
- Outside Ex zone (Ex ib barrier to Zone 1)
- GSM / GPRS / LTE-M / NB-IoT

Powers correctors + RS-485. Scheduled polling. Server can push gas params (density, CO, N_2) to all correctors.

AUTONOMOUS IoT UNIT

VADTel AIIoTU8

- Li-Ion 8000 mAh · ≥ 5 (10) yrs
- Outside Ex; Ex ib IIC T4 Gb on RS-485
- MQTT-TLS · HTTPS · OTA

Autonomous industrial telemetry where no mains is available. Intrinsic-safe barrier to Zone 1 correctors.

RESIDENTIAL / COMMERCIAL AMR

VADTel AIoTU5

- 5 or 10 years autonomous operation
- Prepaid SIM · plug-and-play
- Anti-tamper hardened · −35 °C

Plug onto any residential or commercial meter (gas · water · electricity) and it transmits for a decade. Mass-rollout smart metering without infrastructure changes.

" IIoTU3, AIIoTU8 and AIoTU5 are installed outside hazardous areas. Connection to certified Zone 1 equipment is made through an integrated Ex ib RS-485 / RS-232 intrinsically-safe barrier — compliant with ATEX 2014/34/EU, EN 60079-0 / -11 / -14. "

SMART METERING · DOMESTIC & COMMERCIAL AMR

Two paths to smart metering — one VAD ecosystem.

SMART GAS METER

VADTEL-MT G6 – G25

Micro-thermal measurement · no moving parts

Flow · G6	0.06 – 11 m³/h
Flow · G10 – G16	0.1 – 25 m³/h
Flow · G25	0.25 – 40 m³/h
Operation	−40 to +55 °C · IP65
ATEX	1Ex ib IIB T4 Gb X
Comms	GPRS / NB-IoT (opt. LoRaWAN, RS-485)
Battery	dual — > 6 yr metrology, up to 10 yr
Shut-off	built-in solenoid valve

MID 2014/32/EU · EN 1359 · EN 12405 · ATEX · CE

Standalone or telemetry-integrated. Full MID-certified metering for residential and commercial gas billing.

ECM · RETROFIT MODULE

Electronic Counting Mechanism

Upgrade any diaphragm meter to smart

Compliance	EN 1359:2017 · MID 2014/32/EU
Operation	−40 to +60 °C · UV-resistant
Comms	GSM / NB-IoT / LTE-M
Battery	LiPo 2000 mAh · 5 – 10 yr
Data saving	proprietary protocol, −70 % GSM load
Shut-off + AI	remote valve · leak anomaly detection

MID-eligible · RED · CE · RoHS · GDPR

Dual independent power supplies (metrology + telemetry). Session-diversity transmission. AI leak detection during valve-open state.

Replace, or retrofit. Either way — MID-grade data, end-to-end through VAD.

SENSOR · ATEX ZONE 1 · EDGE AI

The only Zone 1 sensor in the stack — with on-device event AI.

VADTel SENS is directly ATEX-certified for Zone 1 installation on the gas pipeline, and classifies the type of network event on-device — not just flags the anomaly.

ATEX II 2G Ex d IIC T6 Gb X | IP65 · −40 …+85 °C | GSM · GPRS · NB-IoT | Autonomous · 3 battery variants | M20 × 1.5

PRESSURE RANGES

Gauge	0 – 40 kPa (low-pressure)
Absolute	160 / 400 / 600 kPa · 1.0 / 1.6 / 2.5 / 4.0 MPa
Custom	up to 60 MPa on request

AUTONOMOUS POWER · 3 BATTERY VARIANTS

Standard	~2 000 communication sessions
Extended	~4 500 communication sessions
Maximum	~8 000 communication sessions

ON-DEVICE EDGE AI

The embedded AI classifies the type of event — pressure drop from compressor failure, from a leak, from valve closure — directly on the sensor. Actionable in seconds, not minutes.

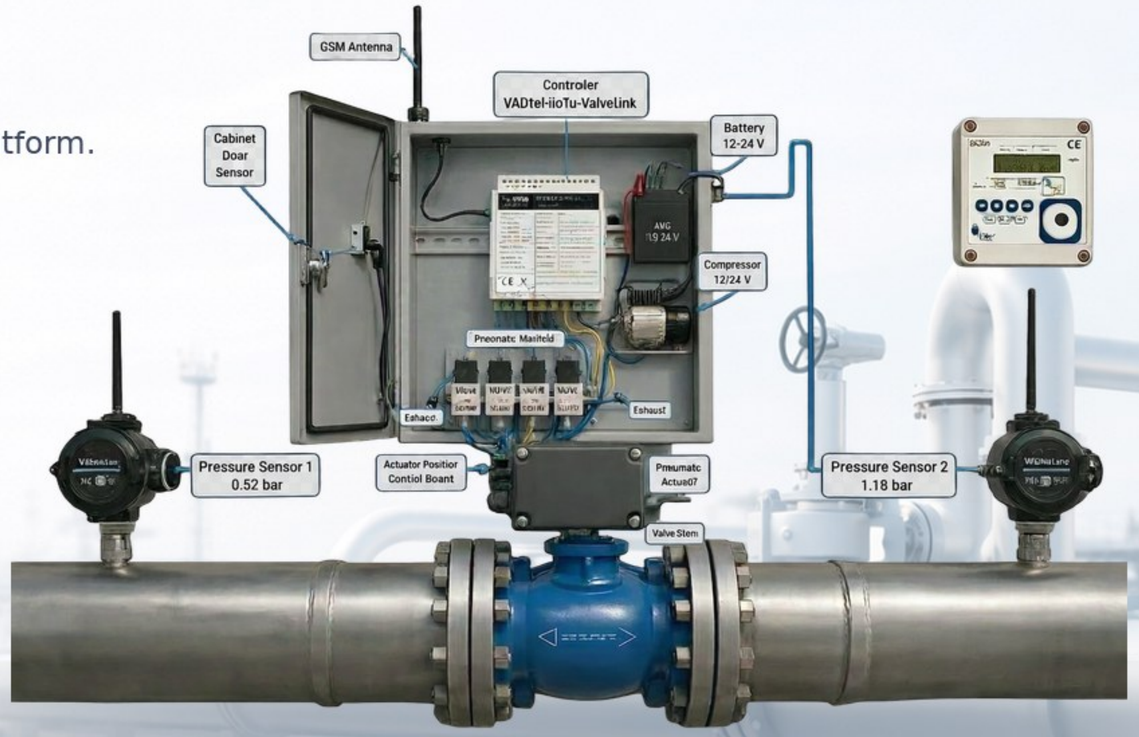
CABINET · COMPLETE FIELD STATION

One enclosure — a whole metering node.

Everything a gas operator needs in a single, field-rated cabinet: controller, power, pneumatics, valve actuation and telemetry to the platform.

WHAT'S INSIDE

- **Controller** — VADTel-IIoTu-ValveLink on DIN rail
- **Power** — Battery / PSU · optional PV controller
- **Pneumatics** — Compressor · 4-valve manifold + exhausts
- **Position sensing** — Actuator position control board
- **Security** — Cabinet door (tamper) sensor
- **Connectivity** — GSM / NB-IoT antenna · RS-485 bus
- **External I/O** — Pressure sensors (×2) · resource meters
- **Environmental** — IP54 · −40…+60 °C · IK07



Reference installation · ValveLink VAD-IIOTU-VLK-01 · designed for −40 … +60 °C continuous outdoor service

Illustrative — exact component layout varies by project wiring and local regulation.

VAD
S.r.o.

PLATFORM · ENTERPRISE IoT

One operator console — 100 000+ devices worldwide.

Real-time ingest, event streaming,
15 AI microservices and full audit trail.
API-driven — integrates with your
SCADA, ERP, GIS and billing stacks.

100 000+
devices on the platform

15
AI microservices

10+
countries deployed

24/7
audit log · RBAC

PLATFORM · INTELLIGENCE

Fifteen AI microservices — across three operational pillars.

5 RELIABILITY & FIELD INTEGRITY
microservices

- Leak signature detection
- Tamper & bypass detection
- Predictive device health
- Battery-drain anomaly
- Archive error & fault detection

7 NETWORK & OPERATIONS
microservices

- Pressure forecasting
- Consumption forecasting
- Consumption anomaly detection
- Valve actuation risk scoring
- Corrector drift detection
- Gas pressure-reduction station monitoring
- **On-device edge-AI event classification (SENS)**

3 COMMERCIAL & ESG
microservices

- UAFG (unaccounted-for gas) analytics
- Efficiency & consumption-reduction advice
- CO_2 footprint reporting (EU Methane Reg. 2024)

… and more in the roadmap. Each microservice is an independent, API-addressable unit.

VAD
S.r.o.

OPERATOR WORKFLOW · VALVE CONTROL

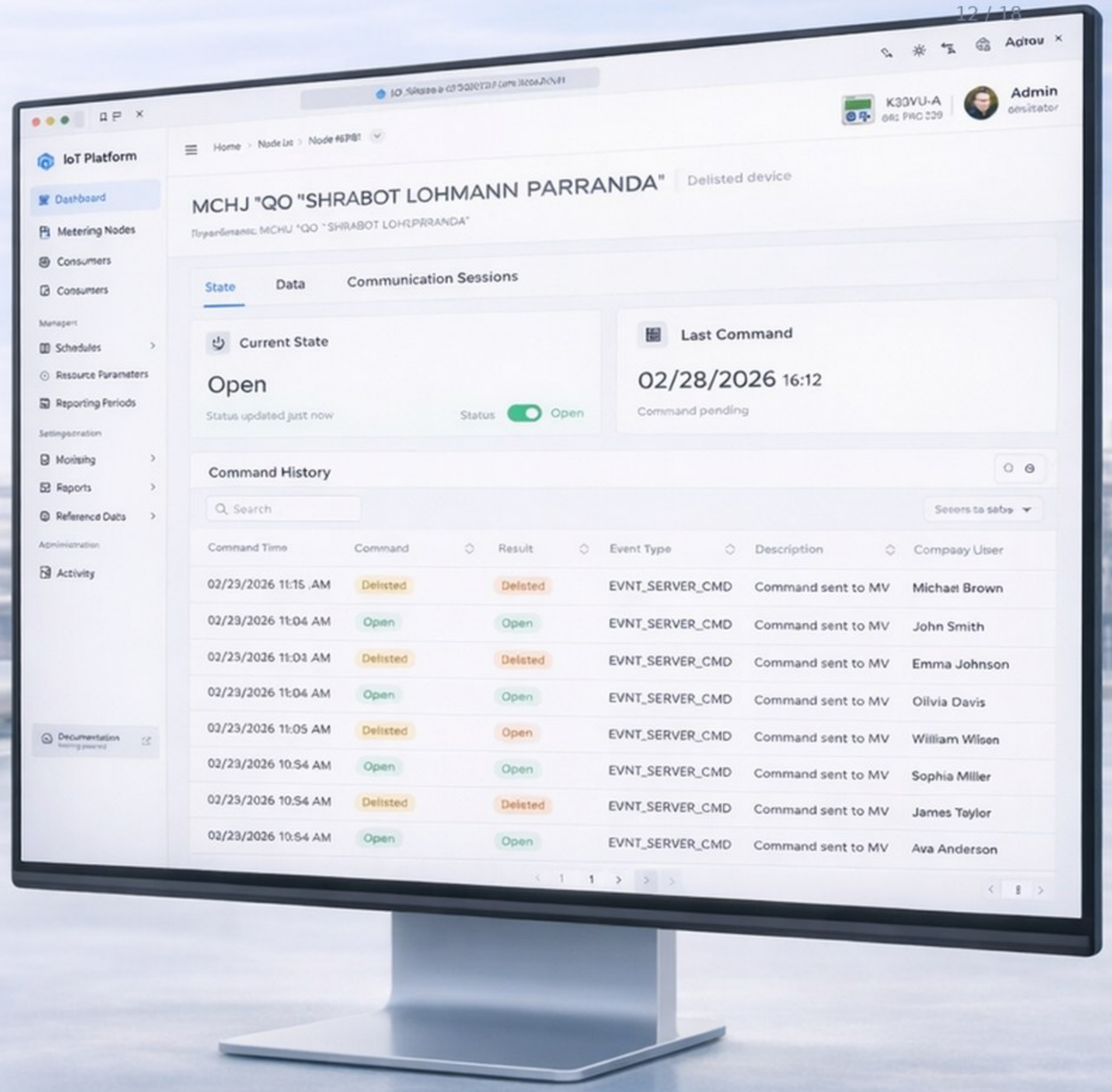
Anomaly → valve-close — with a complete audit trail.

Three-step guarded workflow — detect, confirm, execute.
Every step logged for replay.

01 DETECT
SENS edge-AI or platform detects an anomaly — pressure drop, leak signature, tamper.

02 CONFIRM
Operator reviews context, verifies role-based permissions. Dual approval optional.

03 EXECUTE
ValveLink closes actuator. Position sensed in real time. Every event written to audit log.



SCALE · LANGUAGES · DEPLOY EVERYWHERE

One platform — any scale, in any language.

SCALABILITY · FOUR TIERS

T1 NATIONAL
National operator · multi-region holding
1 platform

T2 REGIONAL
Regional DSO / TSO · country or oblast
10 000+ nodes

T3 DEPOT
District depot · operations team
1 000 nodes

T4 NODE
Cabinet or meter · field install
1 node

One architecture. From 1 node to 10^6 — no re-platforming.

LOCALISATION · 17 LANGUAGES

MASTER
English

TIER 1 · EU
German · Slovak · Czech · Polish

TIER 2 · EEA
French · Spanish · Italian · Hungarian
Romanian · Dutch

TIER 3 · GLOBAL
Turkish · Arabic (RTL) · Russian
Uzbek · Kazakh · Chinese

LOCALISED DELIVERABLES

- Interface strings · role-based dialects
- Installation & commissioning guides
- API docs · integration reference
- Product passports · certificates

SECURITY · SOVEREIGNTY

Built for critical-infrastructure — own code, audited end-to-end.

Four-layer defence across device, transport, platform and storage.
Source-code escrow available. Full IP transfer available for national operators.

EDGE 01

Edge

- Signed firmware · secure boot
- Tamper-evident enclosure
- ATEX barrier · intrinsic safety

TRANSPORT 02

Transport

- TLS 1.3 · MQTT-TLS · HTTPS
- VPN tunnels
- Certificate-pinned cellular

PLATFORM 03

Platform

- RBAC · scoped API tokens
- Full immutable audit log
- ISO/IEC 27001 in progress

STORAGE 04

Storage

- Encryption at rest (AES-256)
- Segregated backups · DR
- GDPR · data residency options

SOVEREIGNTY
Own code base · no Windows DLL dependency · optional source-code escrow · full IP transfer for national operators.

COMPLIANCE · STANDARDS

Engineered to the standard — certified, auditable, documented.

HARDWARE

EMC 2014/30/EU	held
RED 2014/53/EU	held · LGAI / APPLUS 0370-RED-5126
RoHS 2011/65/EU	held
WEEE 2012/19/EU	compliant
ATEX 2014/34/EU	SENS II 2G Ex d IIC T6 Gb X · MT G6 1Ex ib IIB T4 Gb X
MID 2014/32/EU	applicable · metrology variants
EN 60079-0 / -11 / -14	intrinsic safety on controllers
EN 62311 · SAR/MPE	held · SHE24050058-01DE

COMPANY & PLATFORM

ISO 9001	held
ISO/IEC 27001	in progress
ISO 14001	in progress
GDPR (EU 2016/679)	compliant
NIS2 Directive	platform design aligned
EU Methane Reg. 2024/1787	operator reporting supported
Manufacturing	IPC-A-610 Class 2 · Vixint varnish
Cybersecurity	RED-compliant · signed OTA

PILOT SCENARIOS · INDICATIVE METRICS

Pilot-derived, 12-month window — indicative, repeatable, defensible.

Operator-specific results depend on deployment scope and network topology.

−35 %	≤ 30 sec	99.7 %	≤ 90 sec	−3 pp
Manual cabinet visits	**Anomaly → operator alert**	**Auto meter-read capture**	**Anomaly → valve close**	**UAFG in pilot zone**
After full ValveLink + EIP rollout.	From field event to dispatcher console.	Baseline manual reads ≈ 92 %.	With operator confirmation + audit trail.	Unaccounted-for gas, 12-month window.

Pilot-derived, 12-month window · indicative values · operator-specific results depend on deployment scope and network topology.

COMMERCIAL · THREE DEPLOYMENT MODELS

Three ways to deploy — one technology stack.

A — Managed IIoT-as-a-Service

OPEX-only · VAD operates the platform

- VAD hosts & runs the EIP
- SLA-bound availability and response
- Monthly / annual per-node pricing
- Fastest time-to-value — days

SUITED FOR

Suited to operators who prefer to consume the service rather than run the stack.

B — On-premise + source escrow

CAPEX + annual support

- DSO runs platform on its own infrastructure
- Source code placed in escrow for continuity
- Annual maintenance & updates
- Full operational control

SUITED FOR

Suited to operators with mature DevOps capability and continuity requirements.

C — Full IP transfer

+ local production · for national operators

- Full source-code transfer
- Documentation and development rights
- Optional in-country production setup
- Independent long-term roadmap

SUITED FOR

Aligned with sovereignty and critical-infrastructure requirements of state-owned holdings.

WHY VAD · NEXT STEP

Engineering industrial IoT since 1995.

30+ years
of industrial IoT engineering

100 000+ devices
deployed globally across 10+ countries

4 regions
EU · MENA · Americas · Asia

vadsro.eu

/ solutions / oil-and-gas-iot

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NEXT STEP

Pilot scope workshop
90 minutes · online or on-site · outcomes: scope & commercial

→ **inbox@vadsro.eu**