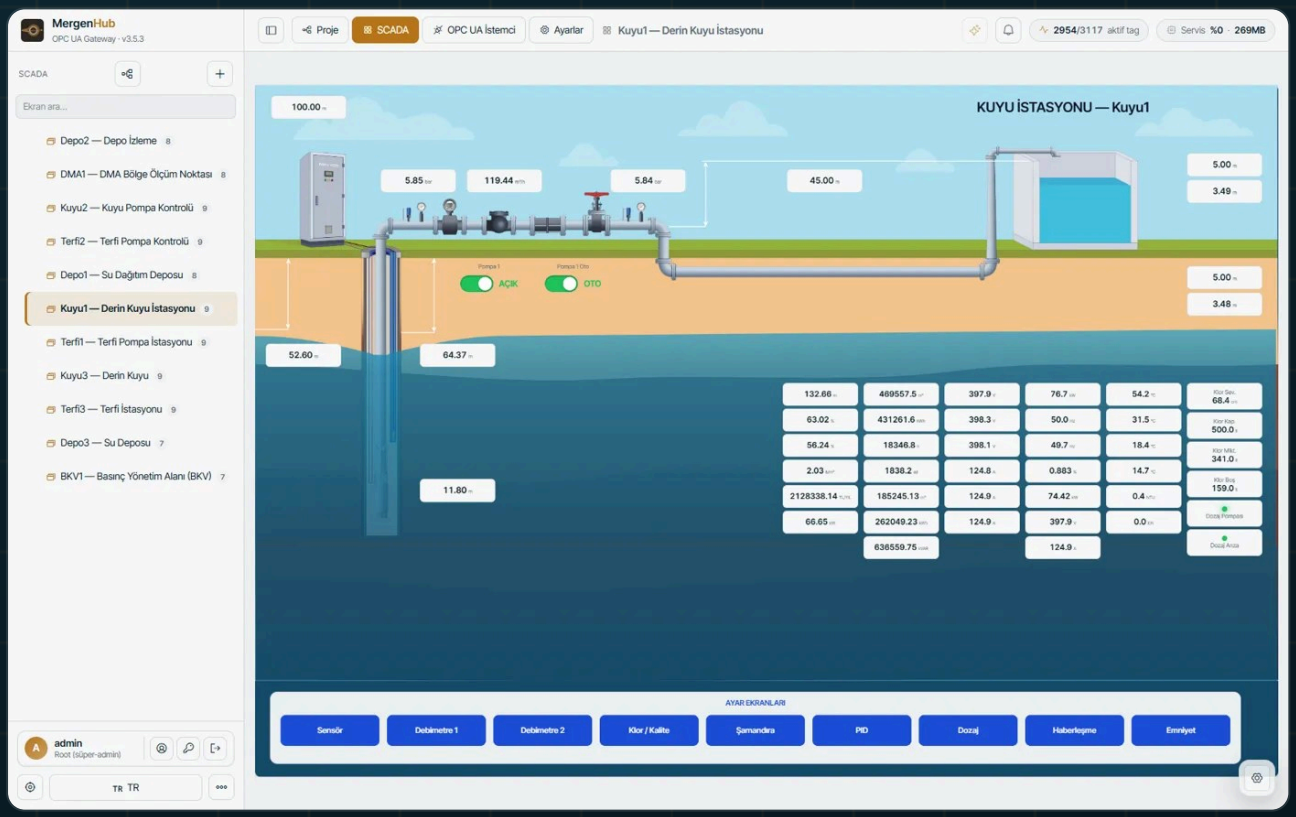
MergenHub

ENVEST ENERGY AND WATER TECHNOLOGIES

PRODUCT OVERVIEW

Every device in the field, on a single platform.

Industrial data acquisition, OPC UA gateway and web SCADA platform. Locally developed software, backed directly by its manufacturer.



11 protocols

Modbus, S7, OMRON, IEC 104, IEC 61850, DNP3, MQTT, OPC UA

450,000 tags

core tested at this scale

Unlimited

users, clients, screens and stations

Web + Mobile

browser with no installation, iOS and Android

OVERVIEW

The data layer between the field and the organization

MergenHub collects data from PLCs, RTUs and measurement devices, makes sense of it, stores it, and delivers it to both people and other software. Communication drivers, OPC UA server, web SCADA, data logging, alarms and notifications, user permissions and mobile access all come in a single product, with a single installation.

Single installation
Windows service; physical or virtual server

On-premises
data stays on your own server, no cloud requirement

From the browser
administration and SCADA; no client installation

Tag-based
licensing; no limit on users or clients

Who it is for

WATER AND WASTEWATER

Drinking water and sewerage

- Wells, reservoirs and pumping stations
- DMA zone measurement points, water loss monitoring
- Pressure management (PRV) and valve control
- Chlorine dosing, flow, level, energy consumption

ENERGY

Generation, distribution, consumption

- Substations and protection relays (IEC 61850, IEC 104, DNP3)
- Solar plants and energy analyzers
- Consumption, cost and efficiency calculations

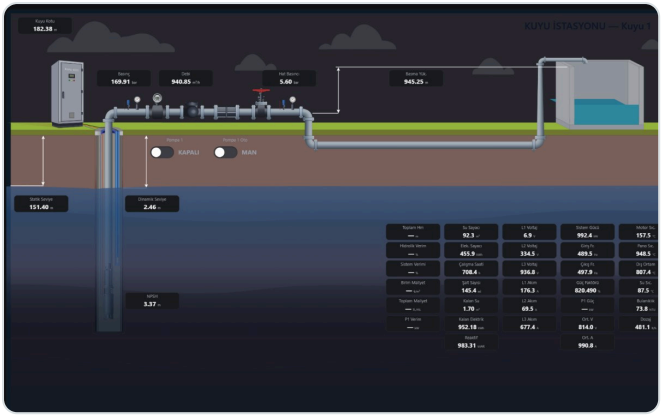
MANUFACTURING PLANTS

Factory and process

- PLCs of different brands combined in a single data layer
- OPC UA, SQL and REST to MES, ERP and reporting systems
- Line screens, alarm and shift tracking

Why MergenHub

- **Vendor independent:** devices from different manufacturers work together on the same server.
- **Ready to start:** with the device library and 3D station templates, a station goes live with its screen in minutes.
- **Open data:** measurements are written to standard relational tables and can be read by any reporting tool.
- **Local manufacturer:** Turkish interface and manual, direct manufacturer support, fast response to requests from the field.
- **Security from the start:** role-based permissions, strong password policy, tamper-proof audit log, HTTPS.
- **Predictable cost:** only the tag count is licensed; all releases are free for the duration of maintenance.



Deep well station: pump, level, flow and energy

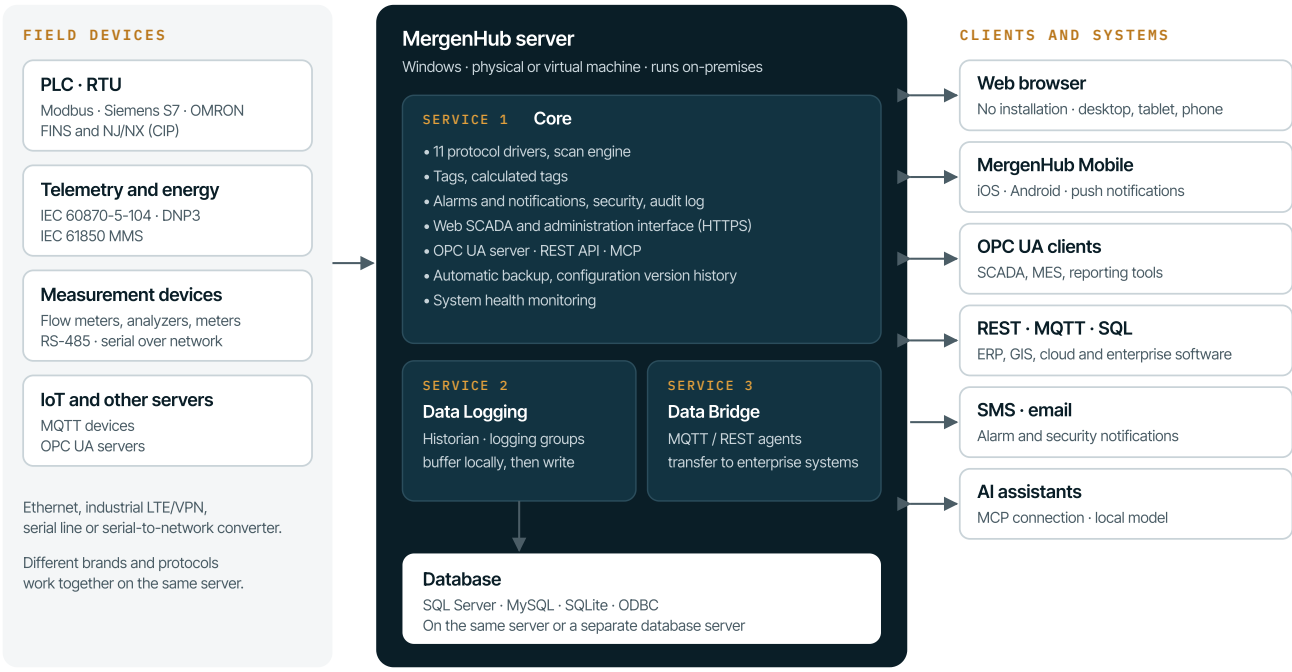


Pumping station: pump group, reservoir levels, pressure

ARCHITECTURE

End to end, from the field to the client

MergenHub runs on your own server. It talks directly to field devices and needs no intermediate gateway or protocol converter. Its tasks are split across three separate Windows services: if one restarts, the others keep running.



SERVICE 1

Core

Communication drivers, scan engine, tag and calculation engine, alarms, security, web interface, OPC UA server and REST API. By scanning only the data actually in use, it protects field devices and the line from unnecessary load.

SERVICE 2

Data Logging (Historian)

Writes logging groups to the database. If the database is unreachable, it buffers the data locally and transfers it in full once the connection returns.

SERVICE 3

Data Bridge

Forwards data to enterprise systems, the cloud or other applications with MQTT and REST agents, and receives data coming from external systems.

Installation options: Windows 10/11 and Windows Server; physical machine, VMware, Hyper-V and other virtualization platforms. The database can be on the same server or on a separate database server. No internet connection is required.

COMMUNICATION

11 industrial protocols, on a single server

Each channel runs independently with its own driver, timeout and reconnection settings. A problem on one device does not affect the others; when a connection drops, the driver recovers on its own.

Protocol	Use and highlights
Modbus TCP · RTU · ASCII	PLCs, analyzers, flow meters and meters. Serial line, Ethernet and serial-over-network (serial-to-network converter) connections; block reads, byte/word order and scaling settings.
Siemens S7	S7-200 SMART, S7-300/400, S7-1200/1500. Data blocks, inputs/outputs and markers are addressed directly.
OMRON FINS · NJ/NX (CIP)	FINS for the CP/CJ/CS series; symbolic CIP access by variable name on the NJ/NX series.
IEC 60870-5-104	Master station: general interrogation (GI), spontaneous data, commands (C_SC, C_DC, C_SE), clock synchronization, source timestamps are preserved.
IEC 61850 MMS	Protection relays and substation devices; logical node level reads, model discovery.
DNP3	Telemetry and energy RTUs; integrity poll, event data, control commands.
MQTT	A broker per channel, a topic per device; ready-made parsers including JSON and plain text.
OPC UA client	Connects to other OPC UA servers, browses nodes and brings them into MergenHub as tags.
Simulator	Virtual devices for trying out screen, alarm and logging scenarios without going to the field.

Online tag discovery

On supported devices, tags are not typed in by hand: MergenHub connects to the device, reads its point list and adds the selected ones as tags (IEC 61850 model scan, DNP3 integrity poll, IEC 104 general interrogation, OPC UA node browse).

Existing projects are preserved

Kepware projects (channels, devices, tags) can be imported; the existing configuration moves to MergenHub without being re-entered. The communication diagnostics screen shows the packets exchanged with the device.

OPC UA SERVER

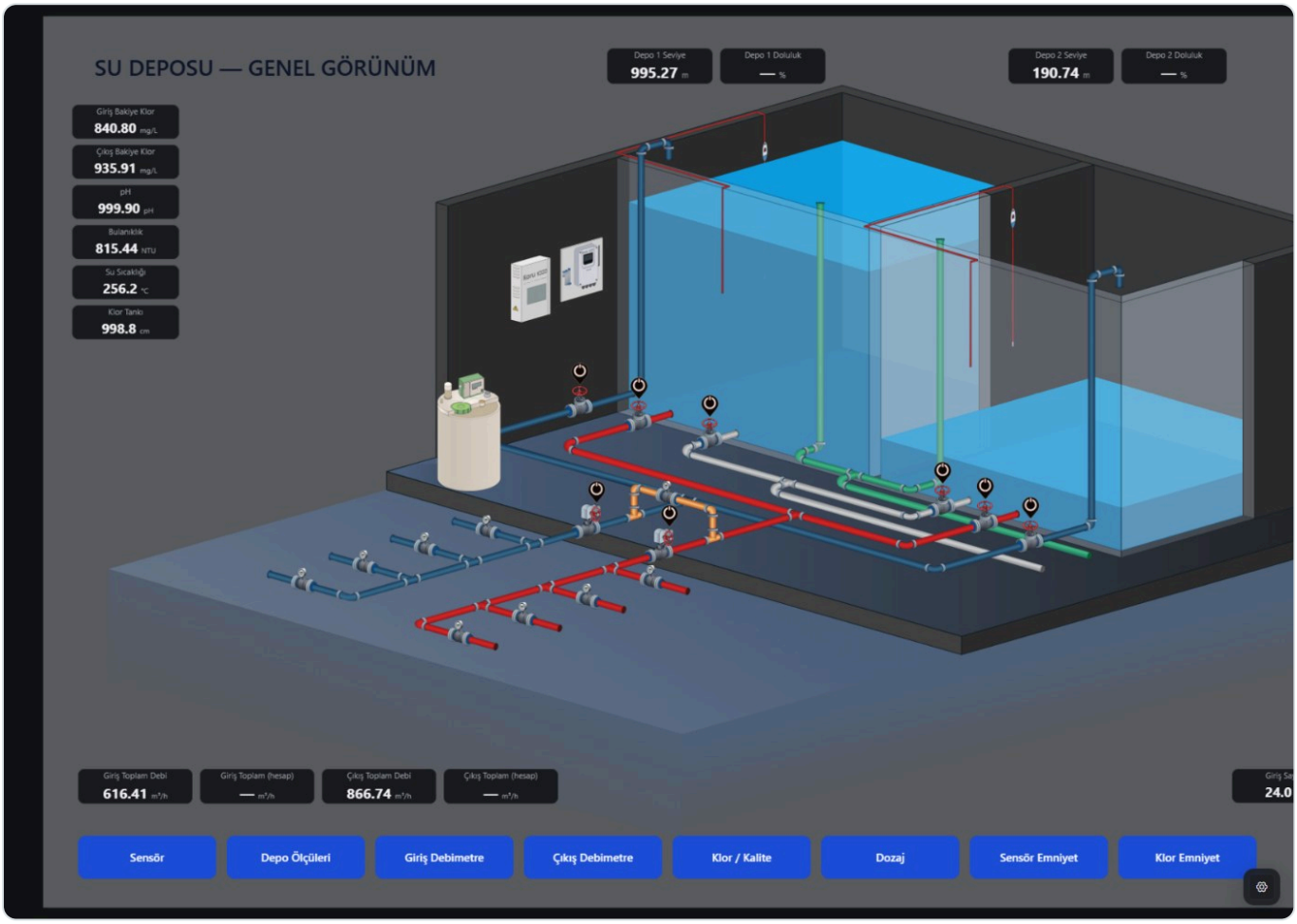
All data at a single standard endpoint

- **Multiple endpoints:** separate endpoints for different network interfaces and ports.
- **Security policies:** Basic256Sha256, Aes128-Sha256-RsaOaep, Aes256-Sha256-RsaPss and compatible policies for legacy clients; signing and encryption modes.
- **Certificate management:** trusted and rejected client certificates are managed from the interface.
- **History read (HistoryRead):** logged data can be queried directly from OPC UA clients.
- **Alarms & Events:** alarms are published to OPC UA clients as events.
- **Scale:** core tested at 450,000 tags; writes, subscriptions and live configuration changes without interruption.

WEB SCADA

Screens are designed in the browser and monitored from anywhere

The screen editor lives inside the web interface; no separate design program or client license is needed. A finished screen runs at the same time on desktop, tablet and phone.



3D water reservoir template: live level, flow, valve states and navigation to setting screens

Editor

- Drag and drop, alignment, grouping, undo / redo
- More than 260 industrial symbols: pump, valve, tank, pipe, motor, sensor, panel
- 3D well, reservoir, pumping and pressure management station templates; light and dark themes
- Animations: color, fill, visibility, rotation, flow

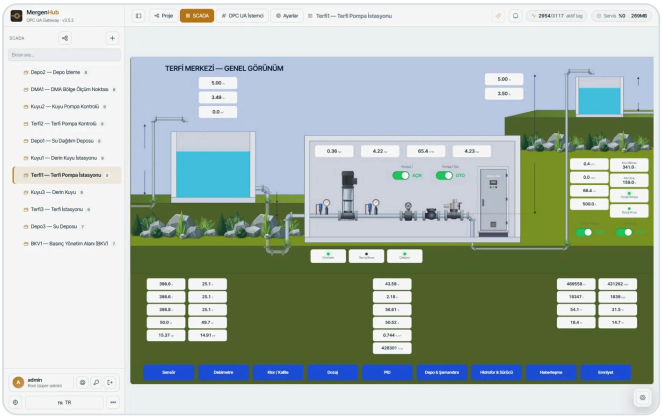
Runtime

- Faceplate windows for one-click settings and control
- Map component: stations with their locations and status colors
- Responsive interface; operator view on the phone
- Zone- and permission-based screen access: each user sees only the stations they are responsible for

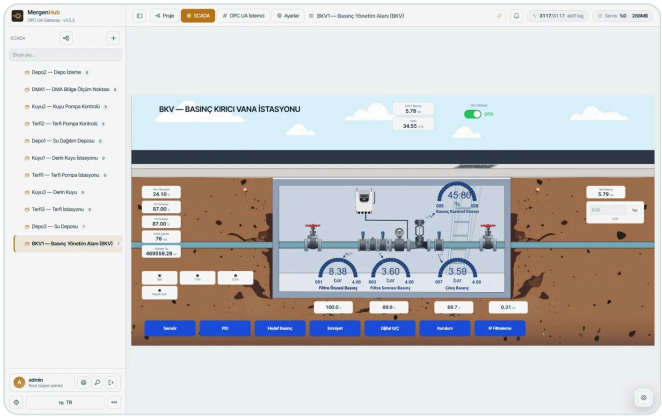
WEB SCADA · SCREEN EXAMPLES

Ready-made screens for every point of the water network

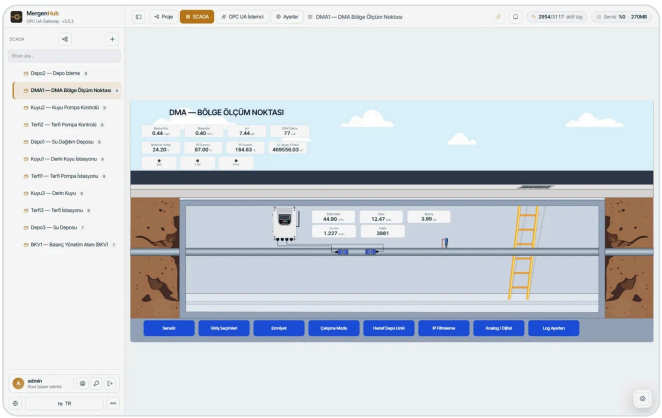
The screens below were captured from the running MergenHub interface with simulated field values. Each one is installed from the device library in a single step and can be modified in the editor to suit your needs.



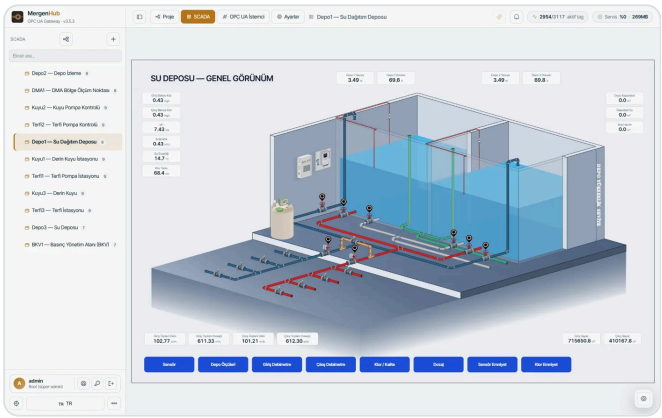
Pumping station: pump states, flow, pressure, energy



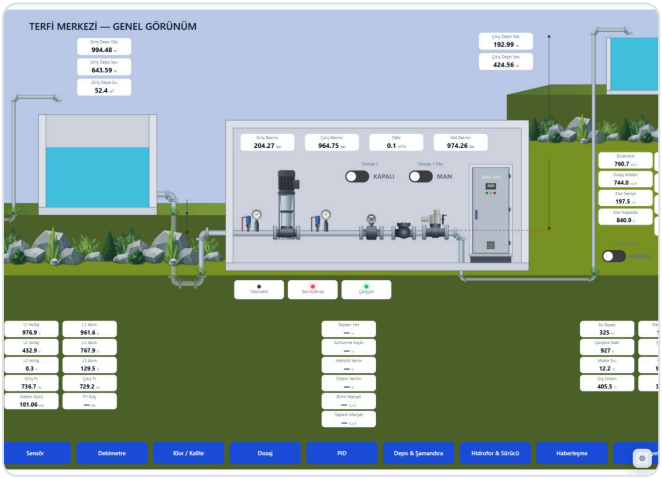
Pressure management area (PRV): inlet and outlet pressure, valve control



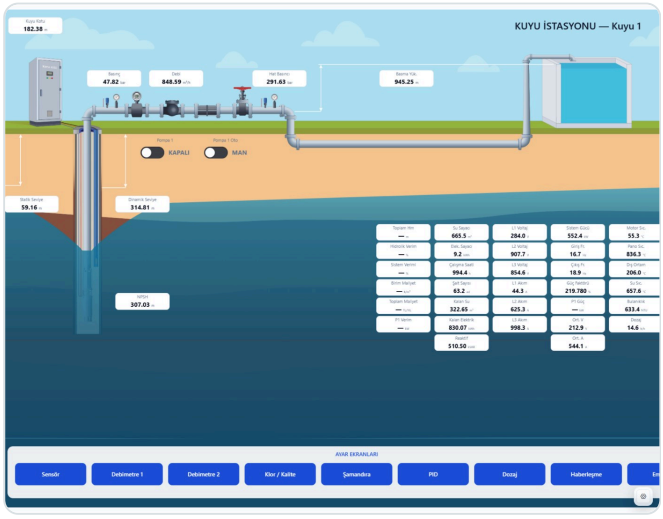
DMA zone measurement point: flow and pressure monitoring



Water reservoir: level, inlet and outlet flow



3D pumping station template, light theme



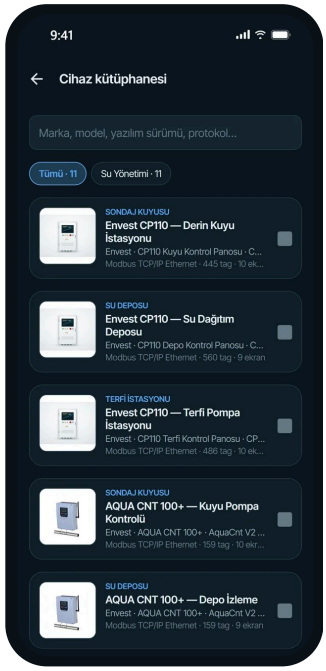
3D deep well template, light theme

DEVICE LIBRARY

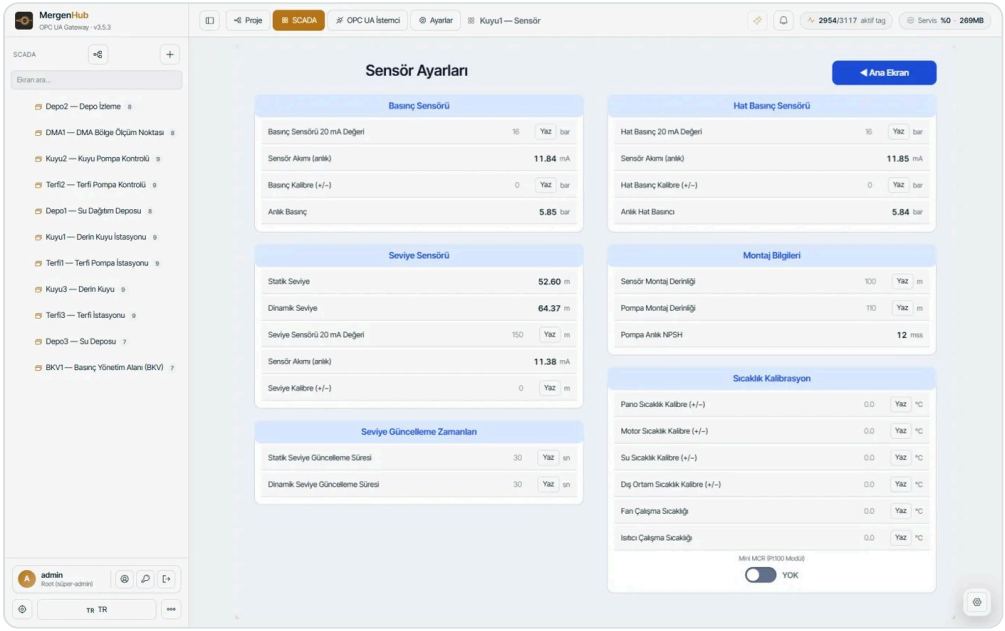
A station up and running in a single step

Ready-made packages in the library bring everything a device needs, together. During installation you only enter the device address; the channel, device, tags and screens open ready to use.

- **Channel and device** together with communication settings
- **Annotated register map:** the name, unit, scaling and description of every tag
- **Calculated tags:** efficiency, total, average, status
- **Computer and phone screens:** station view and setting screens
- **Package file (.mhpkg.json):** package your own devices and move them to other servers and teams
- **Template with AI:** a package draft is generated from the register table in the device manual, and the user approves it



Library catalog — MergenHub Mobile



Setting screen that ships with the package: sensor scaling and limits

CALCULATED TAGS

From raw data to meaningful information

EXPRESSION

Expression engine with 37 functions

Arithmetic, logical and conditional expressions; POLY, MAP, CLAMP and trigonometric functions. A calculated tag can be written back to the field when needed.

STATISTICS

Average · min · max

The instantaneous or time-windowed average, minimum and maximum of selected tag groups.

COUNTER

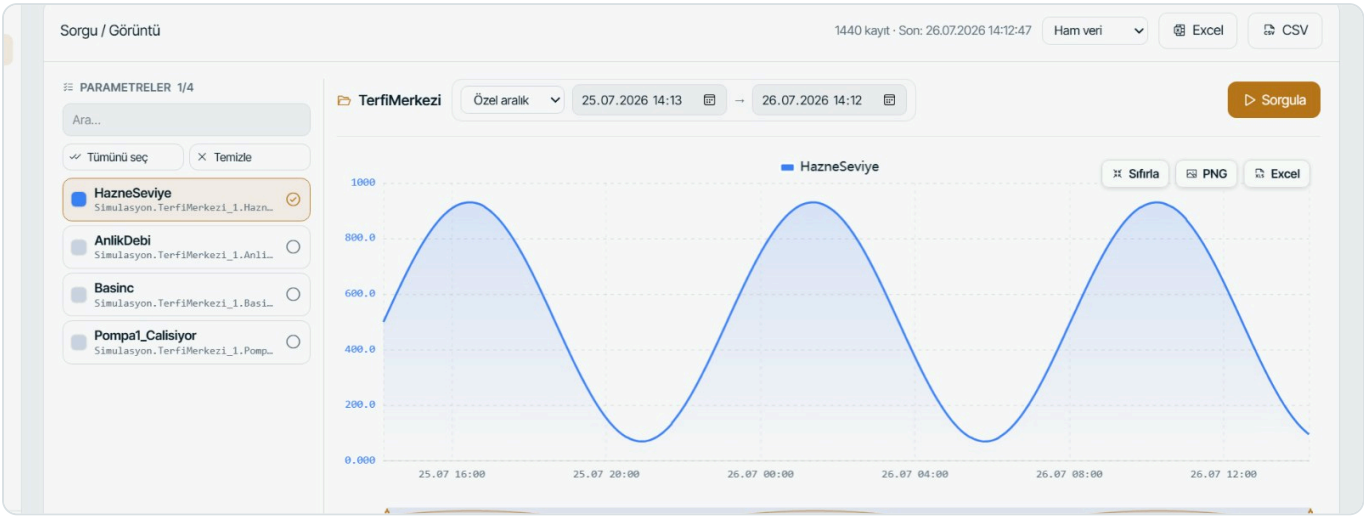
Totalizer and cumulative

Total volume from instantaneous flow, energy from power; periodic reset and cumulative counters.

Ready-made calculations: pump efficiency, energy cost, total flow and consumption; they come with the packages in the device library.

DATA LOGGING (HISTORIAN)

Historical data: lossless, queryable, open



Historical data: date range, multi-parameter trend, zoom and export

- **Databases:** Microsoft SQL Server, MySQL, SQLite and databases with an ODBC driver.
- **Lossless writing:** if the database is unreachable, data is buffered locally and written once the connection returns.
- **Logging groups:** periodic, on-change or conditional triggering; retention period per group.
- **Query and trend:** date range, raw or summarized data, multi-parameter trend charts.
- **Export:** CSV, Excel and XML; large date ranges are prepared on the server side and downloaded as a file.
- **Open schema:** flat relational tables with time, tag, value and quality columns.

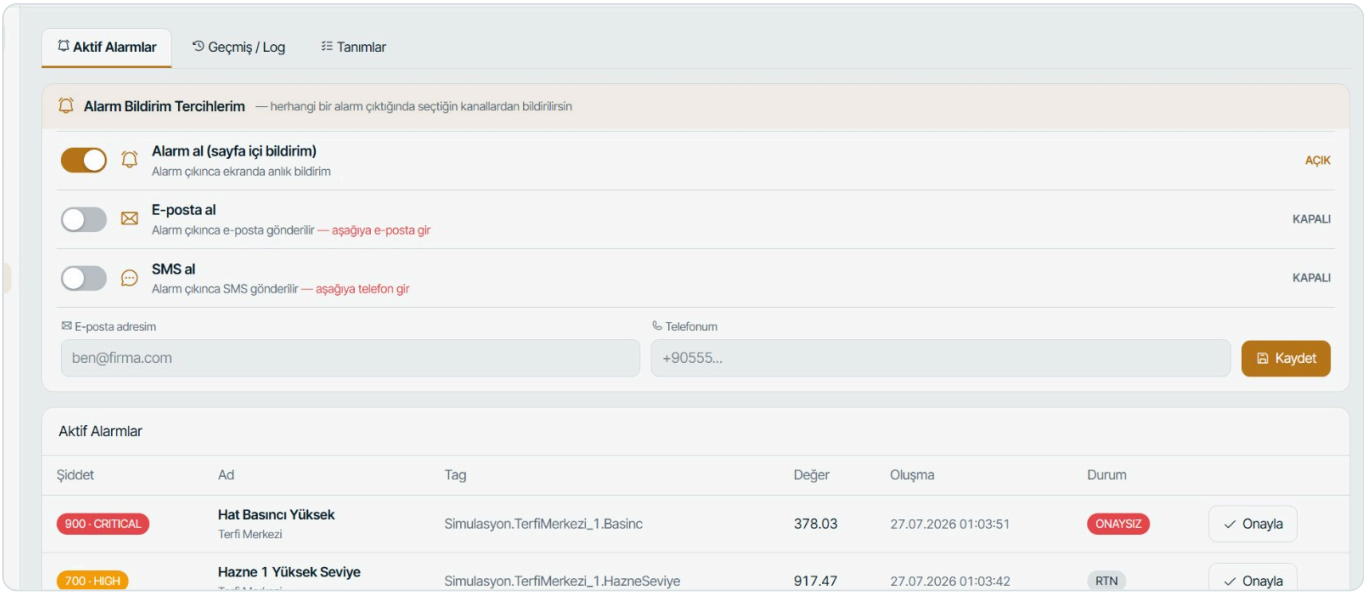
> Logged data can be read in three ways: the MergenHub interface and mobile app, OPC UA history read (HistoryRead) and direct SQL. No additional middleware is needed for reporting.



Tag trend — MergenHub Mobile

ALARMS AND NOTIFICATIONS

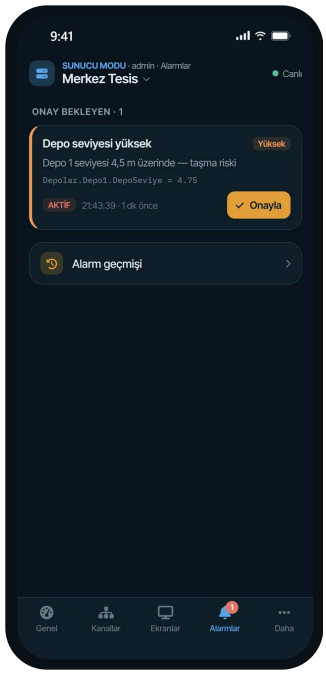
The right alarm, to the right person, instantly



Active alarms, severity, acknowledgment and user notification preferences

- **ISA-18.2 approach:** raised, cleared and acknowledged states; deadband, on-delay and off-delay; severity levels.
- **Visual and audible alarms:** new and unacknowledged alarms are highlighted on screen and sound a warning; sound can be turned on or off per user.
- **Alarm history:** kept for at least 1 year with no limit on the number of records; the period is set in the settings.
- **Email:** over SMTP, with templates and bulk sending.
- **SMS:** NetGSM, İleti Merkezi, Verimor, Twilio and generic HTTP providers.
- **Mobile push notifications:** to MergenHub Mobile; alarms are acknowledged from the phone.
- **Personal preference:** each user chooses which channel they receive notifications on.

> Alarms are also published as OPC UA Alarms & Events; other monitoring systems in the organization see the same alarms on their own screens.



Alarm and acknowledgment — MergenHub Mobile

SECURITY

Who did what, and when: always known

MergenHub is designed to run in critical infrastructure. Access is authenticated, permissions are adjustable down to the finest detail, and every operation is recorded.

AUTHORIZATION

Role-based access

- Built-in roles: Viewer, Operator, Maintenance, Administrator, Super administrator
- User groups and custom roles with 20 separate permissions
- Resource-based access list: at channel, device, screen and zone level
- Permission changes take effect instantly, without signing out

AUTHENTICATION

Password and sign-in security

- Strong password policy: at least 10 characters, upper and lower case letters, digits, special characters; can be enabled or disabled in the settings
- The default password must be changed at first sign-in
- After repeated failed sign-ins, the user and IP are temporarily locked out
- Passwords are stored as irreversible hashes

TRACEABILITY

Audit log and event log

- Every addition, change, deletion, tag write and sign-in: who, when, what, from which IP
- Event log: connection loss and recovery, service events, resource warnings
- Tamper-proof (append-only) log mode: records cannot be modified or deleted by users; only those past their retention period are cleaned up automatically
- Filtering and export

PROTECTION

Security events and communication

- Alarm and SMS / email notification for critical security events (repeated failed sign-ins, lockouts, permission and user changes)
- HTTPS / TLS; redirect from HTTP to HTTPS
- OPC UA certificate management and encrypted endpoints
- Only the super administrator can change security settings

10+
character strong password policy

20 permissions
5 built-in roles, groups, resource-based access

Append-only
tamper-proof audit log mode

TLS
encrypted communication on web, mobile and OPC UA

Recommended structure for remote access: MergenHub stays inside the organization's network; external access is through a VPN and over HTTPS. The server opens only the necessary ports (web interface, optionally OPC UA).

BACKUP AND CONTINUITY

Uninterrupted operation, safe recovery

BACKUP

Daily automatic backup

The project and settings are backed up automatically every day. The destination can be a NAS, an external disk or a local folder; the number of copies to keep is configurable.

VERSION HISTORY

Configuration history

Every configuration change is stored as a version. When needed, you can return to a previous version in a single step.

MONITORING

System health

CPU, memory and disk usage, capacity warnings; notifications for service crashes and unexpected shutdowns. Services restart on their own after a failure.

INTEGRATION

Open to the organization's other systems

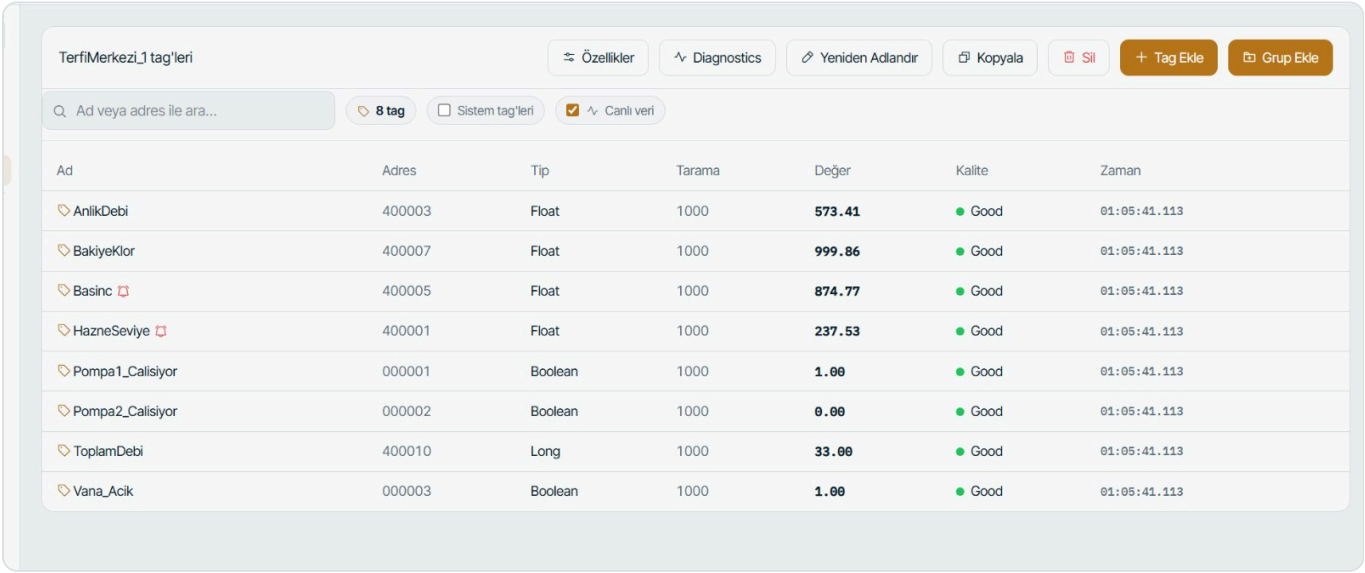
- **OPC UA:** standard access for SCADA, MES and reporting software; history read and alarms & events.
- **REST API:** configuration and live data; an interface documented with Swagger and protected by session.
- **Data Bridge:** transfer to cloud platforms, ERP and GIS systems with MQTT and REST agents.
- **SQL:** logged data sits in standard tables; reporting tools connect directly.

ARTIFICIAL INTELLIGENCE

Talk to your data

The in-app AI assistant queries tags, alarms and historical data, and helps with configuration. It is optional; it also works with local models on your own server, so no data leaves the organization.

Thanks to the MCP (Model Context Protocol) server, AI assistants access MergenHub through an authorized connection that is written to the audit log.

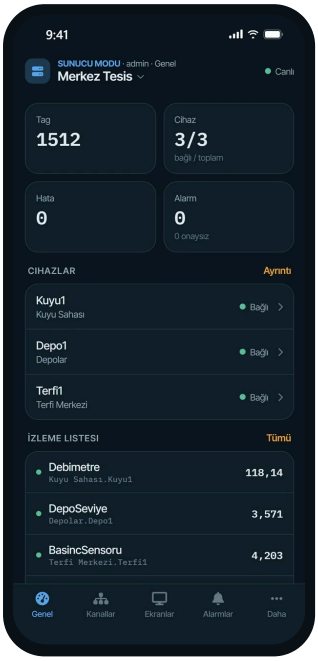


Tag list: address, data type, scan rate, live value and quality

MERGENHUB MOBILE

The facility in your pocket, serverless in the field too

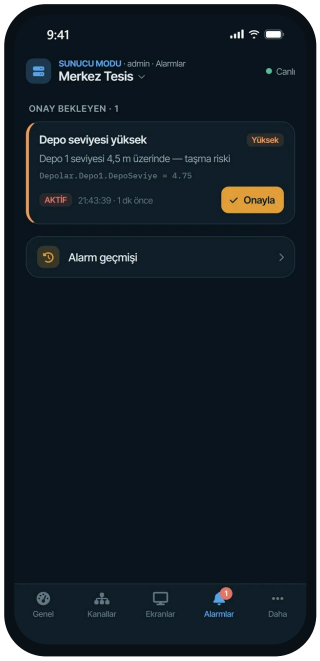
A free app for iOS and Android. It works in two modes: by connecting to the central MergenHub server, or by talking directly to the PLC/RTU in the field.



Server: general status



Station screen



Alarm and acknowledgment



Phone mode: PLC in the field

SERVER MODE

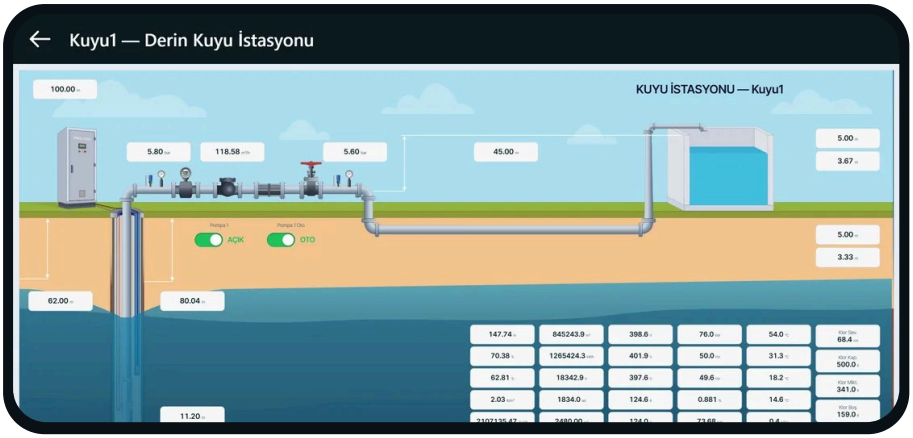
Connected to the center

- Live values, watch lists, tag trends
- SCADA screens, landscape full-screen view
- Alarm list, acknowledgment and push notifications
- Server resources and license status
- An extra confirmation step when making changes on the server

PHONE MODE

Serverless, in the field

- Connect directly from the phone to a PLC/RTU
- The same protocol families as the drivers on the server
- Device library: pick the package, enter the address, the screen is ready
- A field tool for commissioning, troubleshooting and tuning
- A project prepared on the phone can be exported as a package



SCADA screen, landscape full screen on the phone

LICENSING

Only the tag count is licensed

The number of users, web clients, screens and stations is unlimited. When your needs grow, you move to a higher package by paying only the difference; the installation and configuration are kept as they are.

Mini	Starter	Standard	Advanced	Professional	Corporate	Enterprise
250 tags	1,000 tags	5,000 tags	10,000 tags	25,000 tags	50,000 tags	Unlimited tags

LICENSE TYPES

Perpetual or subscription

- **Perpetual license:** no expiry; all releases published during the maintenance period are free.
- **Subscription:** low initial cost; all releases and support included for the duration of the subscription.

ACTIVATION

For servers without internet too

- The license is bound to the server; on a hardware change it is released and activated again.
- Offline activation: servers on networks closed to the internet are activated with a file.
- With the trial version, all features can be tried before purchase.

What is limited	What is unlimited
Total tag count (by package)	Users · web and mobile clients · SCADA screens · stations · channels and devices · alarms · logging groups

IN EVERY PACKAGE

All features included

Only the tag count differs between packages. Communication, web SCADA, data logging, alarms and notifications, OPC UA, REST, Data Bridge and mobile access are in every package.

GROWTH

Upgrade by paying the difference

When your tag needs increase, you move to a higher package by paying only the difference. The installation, project and historical data stay as they are.

THE RIGHT PACKAGE

Working out tags together

The tags you need vary with the number of stations and devices. Every package in the library shows how many tags it uses; Envest determines the suitable package together with you.

INSTALLATION, TRAINING AND SUPPORT

From the manufacturer, from start to finish

INSTALLATION

A single package, in minutes

A single installation package for Windows: services, web interface, HTTPS certificate, OPC UA and the administrator account are set up in the installation wizard.

DOCUMENTATION

Turkish user manual

In-app and online Turkish manual; REST API (Swagger) documentation; sample projects and the device library.

TRAINING

Hands-on training

Operation, screen design, communication, alarm management, user and permission management, backup and restore.

SUPPORT

Direct manufacturer support

Technical support and regular release updates; needs coming from the field are reflected directly in the product roadmap.

GETTING STARTED

A working system in four steps

1

Install

Install the setup package on a Windows server; the wizard prepares the services and the web interface.

2

Add devices

Pick a package from the library and enter the address, or discover tags online from the device.

3

Screens and alarms

Customize the ready-made screens, define alarms and notification channels.

4

Users

Assign roles and zones; teams connect over web and mobile.

Envest Energy and Water Technologies

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MergenHub · MergenHub Mobile · Device Library