



MACHHUB

EDITION 2026

Technical Catalogue

Platform & Gateway

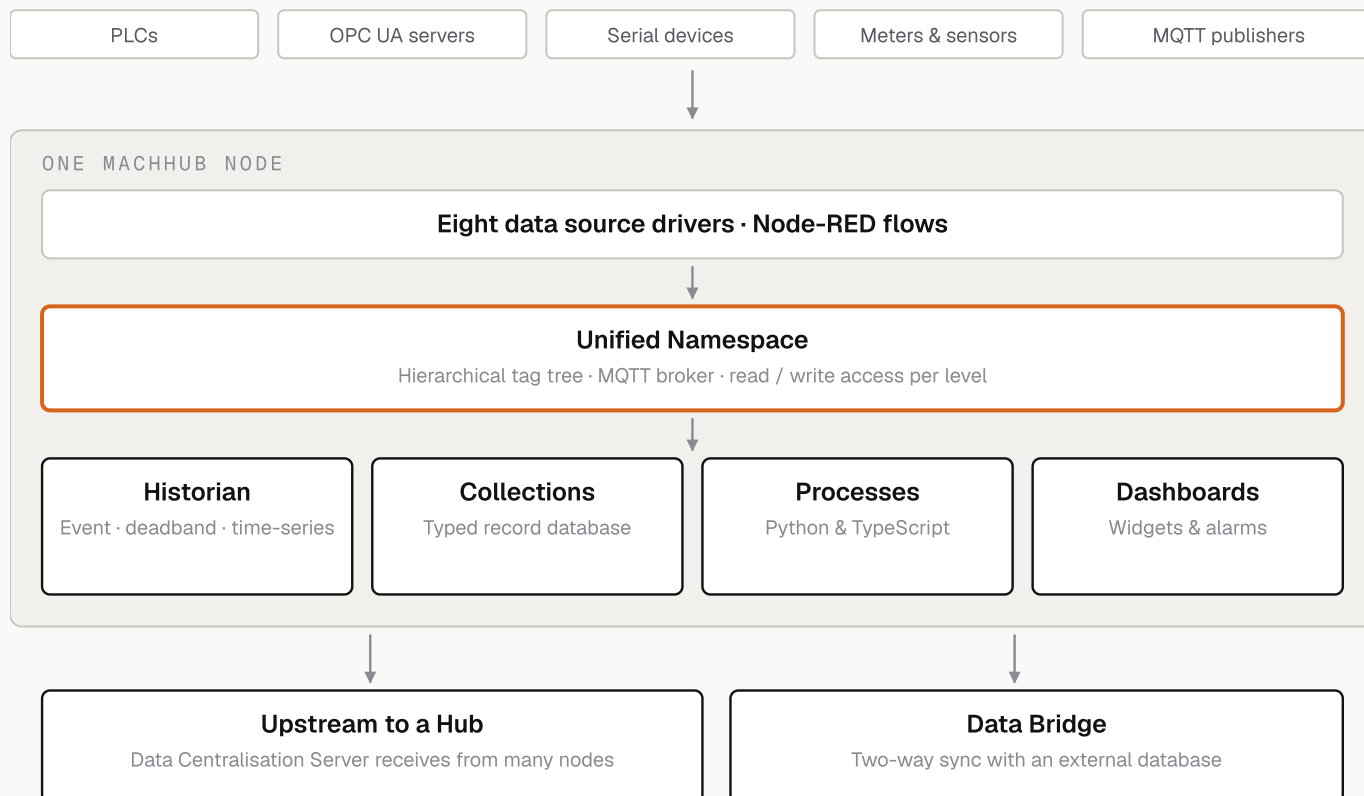
Architecture, capabilities and specifications for
engineers evaluating **MACHHUB** for a plant deployment.

Connect Once. Build Anything.

How it fits together

Every node runs the same binary. Field data lands in a Unified Namespace, and the historian, applications, dashboards and upstream forwarding all read from and write to that one tree.

FIELD LAYER



One namespace, one source of truth

Drivers, flows and applications all address the same hierarchical tag tree. A tag historised for a dashboard is the same tag an application reads and the same tag forwarded upstream, so there is no second copy to reconcile.

Fleet by federation

A Hub runs the Data Centralisation Server and accepts upstream connections from Edge, Panel and other Hubs. Connections are made by the node, so plant nodes need no inbound firewall exceptions.

Four deployment roles

One binary ships with every module. The licence file selects the role a node plays in the fleet, so a node is promoted by installing a new licence file.

EDGE

Monitor a machine

Unified Namespace, tags and MQTT broker
Data source drivers, Node-RED, historian
Dashboards and alarms
No application domains

PANEL

Build custom apps

Everything in Edge
Collections and Processes
Application Development Suite
One isolated application domain

HUB

Run a plant

Everything in Panel
Data Centralisation Server, accepting upstream connections from Edge, Panel and other nodes
Additional application domains on demand

HUB ENTERPRISE

Run the organisation

Everything in Hub
Unlimited application domains
Priority support SLA included

PLUS EDITIONS

Edge and Panel connect upstream to a Hub in their Plus editions. Hub and Hub Enterprise include it as standard and additionally act as the upstream server.

PROMOTION PATH

Changing role is a licence-file swap with no reinstall. Namespace configuration, historised data, dashboards and applications are unaffected.

APPLICATION DOMAINS

An isolated application context with its own runtime and data boundary. Added to a Hub at any time without redeployment.

What each edition unlocks

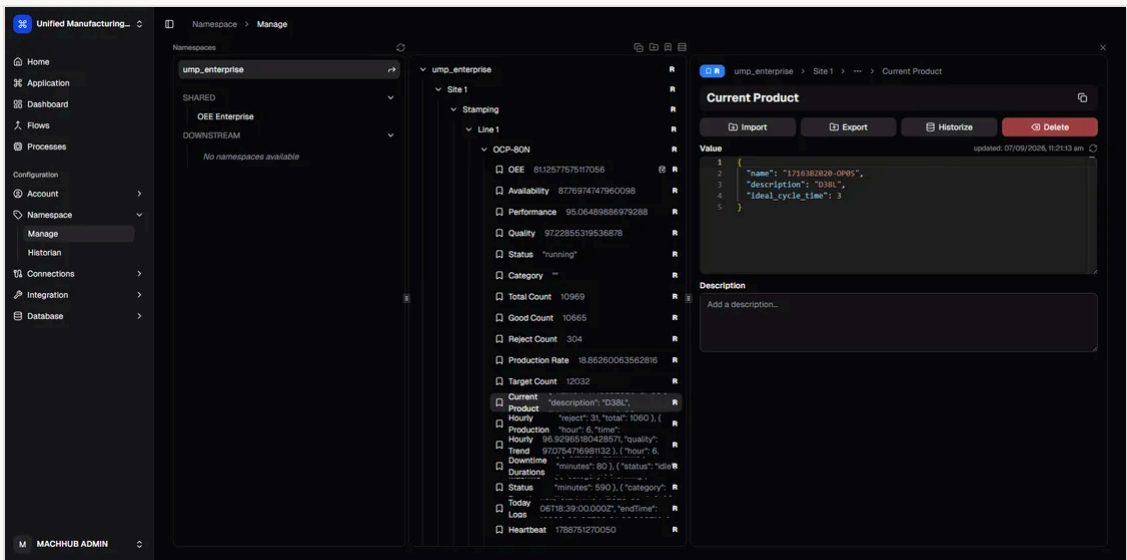
	EDGE	PANEL	HUB	HUB ENT.
DATA & CONNECTIVITY				
Unified Namespace · Tags · MQTT broker	✓	✓	✓	✓
Data source drivers Eight industrial protocols, listed overleaf	✓	✓	✓	✓
Node-RED · OPC UA · Historian	✓	✓	✓	✓
Data Bridge Two-way sync with an external database	✓	✓	✓	✓
VISUALISATION				
Drag-and-drop no-code dashboards	✓	✓	✓	✓
Alarms Active & history, acknowledge, shelve, severity	✓	✓	✓	✓
Shareable read-only dashboard links	✓	✓	✓	✓
APPLICATION PLATFORM				
Collections Typed records database	—	✓	✓	✓
Processes Python & TypeScript	—	✓	✓	✓
Application Development Suite App Runtime · TypeScript SDK · Designer	—	✓	✓	✓
FLEET & SCALE				
Connects to a Hub Upstream client	Plus	Plus	✓	✓
Data Centralisation Server Upstream server	—	—	✓	✓
Isolated application domains included	0	1	1+	∞
OPERATIONS & SUPPORT				
Backup & restore Including off-device backup over SFTP	✓	✓	✓	✓
Priority support SLA	Care	Care	Care	✓

Care is the annual subscription that keeps a licence current and carries the priority support queue. Edge and Panel connect upstream to a Hub in their **Plus** editions.

Configuration import and export covers dashboards, charts and Data Bridge routes. It works throughout **MACHHUB**, available throughout.

Unified Namespace & Historian

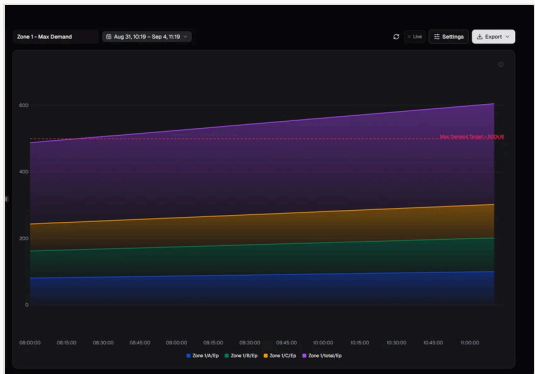
Tags live in one hierarchical tree, published on a built-in MQTT broker. Historisation is configured per tag, so noisy signals and slow signals can be stored on entirely different terms.



The namespace tree with live tag values

HISTORISATION TYPES

Event	Stores every message the tag receives. Use for state changes and counters where no sample may be lost.
Deadband	Stores a sample only when the value moves beyond a tolerance from the last kept value, percent or absolute. An optional maximum interval keeps a flat signal recording.
Time-series	Stores on a fixed tick regardless of change. Use for trends that must be evenly spaced.



Historian query over a date range

Retention

Each historised tag carries its own retention period, enforced by a cleanup job, so long-horizon and short-horizon tags share one instance without manual pruning.

Access control

Read and write permission is set per level of the tree, and namespace bindings decide which subtrees a given upstream connection carries.

Talks to your plant

Eight data source drivers, built in and available from Edge upwards.

No separate connector licences, no per-driver charges.

OPEN STANDARDS

OPC UA	Endpoint and node-ID mapping, with custom path support. Security modes: None, Sign, or Sign and Encrypt.
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Modbus	TCP and RTU.
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Serial	Direct serial devices over RS-232 and RS-485.
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PLC PROTOCOLS

MELSEC (Mitsubishi)	MC protocol 3E/4E for Q, L and iQ-R CPUs; FX communication board; FX tool port.
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SIMATIC S7 (Siemens)	S7-200 over PPI, and S7-300 through S7-1500 over S7comm (ISO-on-TCP).
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FINS (Omron)	Ethernet and serial.
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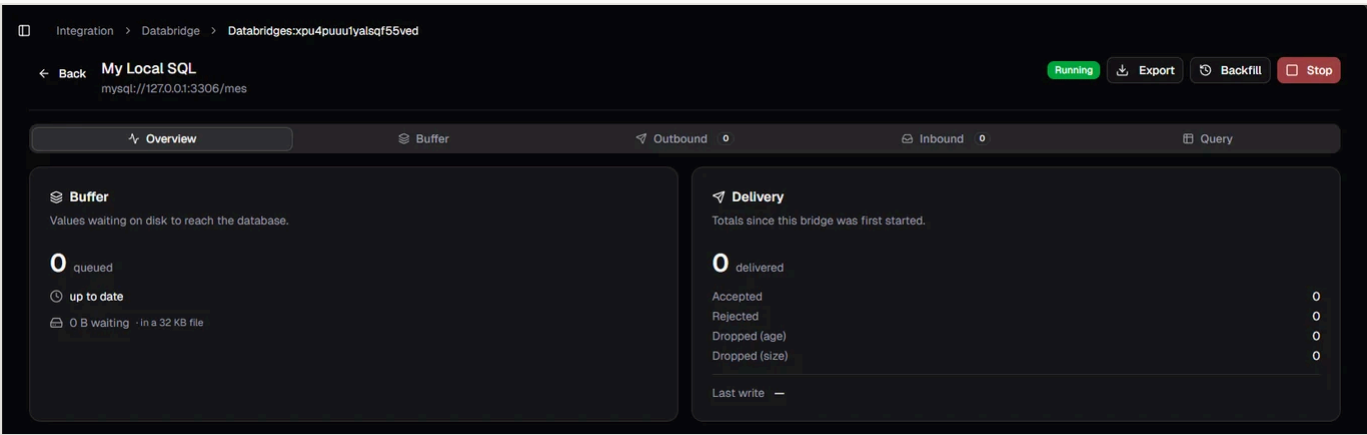
MEWTOCOL (Panasonic)	Ethernet and serial.
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ADS / TwinCAT (Beckhoff)	TwinCAT 2 and 3 over TCP/AMS, reading PLC symbols by name or by index group and offset.
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Anything outside this list can still be brought in through Node-RED or MQTT, both included in every edition.

Data Bridge

Two-way synchronisation between **MACHHUB** and a customer database. Values queue on disk when the link drops and drain in order when it returns.



A configured bridge: buffer depth, delivery counters and the backfill control

Ingress

Pollers read from the external database on a schedule and publish into the namespace, so records maintained by an ERP or MES appear as tags.

Egress

Namespace values are written to mapped tables and columns, with type mapping proposed from the SQL schema and adjustable per column.

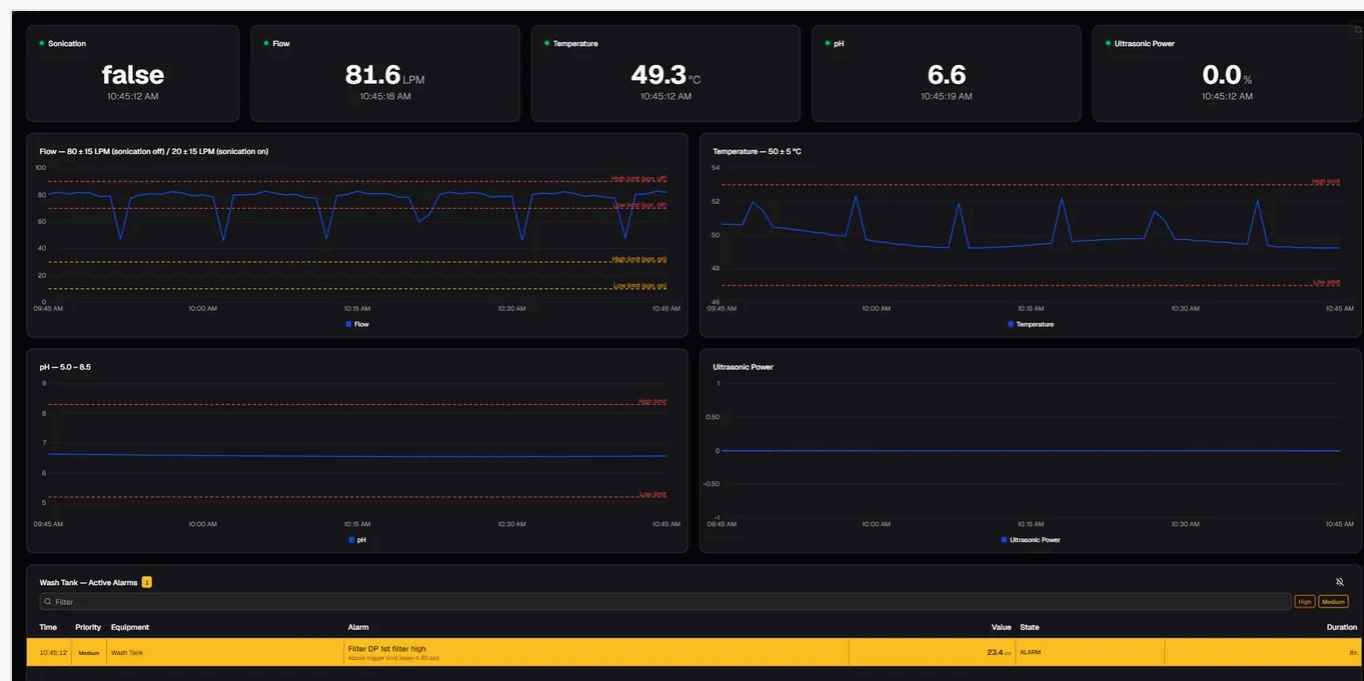
RELIABILITY

Store and forward	Outbound writes queue to a durable on-disk buffer when the database is unreachable and drain in order once it returns. The buffer survives a restart of the node.
Backfill	Re-sends a period from the historian after an outage or a schema change. Runs as a paced background job and can be cancelled mid-run.
Dead letter queue	Writes the database rejects are held rather than dropped, with the error retained, so they can be inspected, retried or purged.
Credentials	Database passwords are sealed at rest and scrubbed from error output.

MySQL is the supported external database. Configuration exports and imports as JSON, so a bridge proven on one line can be moved to the next without retyping it.

Dashboards & alarms

Drag-and-drop dashboards over live namespace data, with alarms an operator can acknowledge, shelf and review.



Live values, trends against configured limits, and an active alarm table on one canvas

Alarms

Active and history modes, severity colours, acknowledge and shelf, audible alerting, filters and a history time range. Alarm widgets sit on the same canvas as everything else.

Shareable links

Any dashboard can be published as a read-only link for viewers with no account, by unguessable token, rate limited per client and revoked by turning the link off.

Raised	Priority	Equipment	Alarm	Peak	Cleared	Duration
10:45:04	Critical	CT-0 Line	Line Status	—	10:45:27	23s
10:45:00	Warning	Wash Tank	Filter DP 1st filter High	23.0 psi	10:45:35	35s
10:44:17	Critical	CT-0 Line	Line Status	—	10:44:43	26s
10:44:17	Critical	CT-0 Line	Guard Door	—	10:44:43	26s
10:43:33	Critical	CT-0 Line	Line Status	—	10:43:57	24s
10:43:32	Warning	Final Rinse Tank	Incoming DI Water Flow low	6.1 LPM	10:43:57	25s
10:42:46	Critical	CT-0 Line	Line Status	—	10:43:12	26s
10:42:46	Critical	Vacuum Dryer	Temperature low	70.2 °C	10:43:12	26s
10:41:16	Critical	CT-0 Line	Line Status	—	10:41:42	26s
10:41:16	Critical	Circulation Pump	Pump Fault	—	10:41:42	26s
10:41:16	Warning	Final Rinse Tank	Incoming DI Water Flow low	3.2 LPM	10:41:42	26s

Alarm history with severity and duration

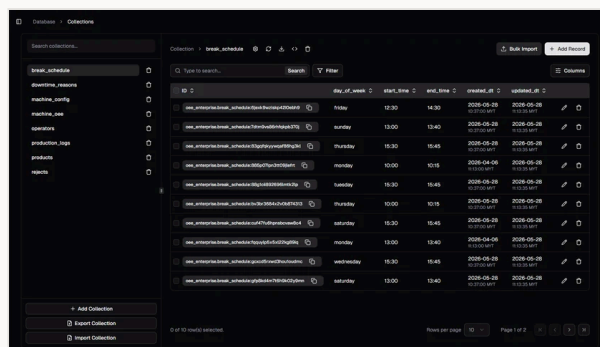
Dashboard and chart configuration exports and imports as JSON, so a screen built for one line can be copied to the next and re-pointed at different tags.

Collections & Processes

Structured data and scheduled logic on the node itself, so recipes, orders and calculations run without a separate server.

COLLECTIONS

A typed record database. Fields carry real types, records relate to one another with defined delete behaviour, and indexes are declared on the collection. Schemas and records import and export as JSON.



ID	Day	Start Time	End Time	Created At	Updated At
1	Monday	10:00	10:15	2020-04-06 10:00:00	2020-05-28 10:00:00
2	Tuesday	10:30	10:45	2020-04-07 10:30:00	2020-05-28 10:30:00
3	Wednesday	10:00	10:15	2020-04-08 10:00:00	2020-05-28 10:00:00
4	Thursday	10:30	10:45	2020-04-09 10:30:00	2020-05-28 10:30:00
5	Friday	10:00	10:15	2020-04-10 10:00:00	2020-05-28 10:00:00
6	Saturday	10:30	10:45	2020-04-11 10:30:00	2020-05-28 10:30:00
7	Sunday	10:00	10:15	2020-04-12 10:00:00	2020-05-28 10:00:00
8	Monday	10:30	10:45	2020-04-13 10:30:00	2020-05-28 10:30:00
9	Tuesday	10:00	10:15	2020-04-14 10:00:00	2020-05-28 10:00:00
10	Wednesday	10:30	10:45	2020-04-15 10:30:00	2020-05-28 10:30:00

PROCESSES

Triggers

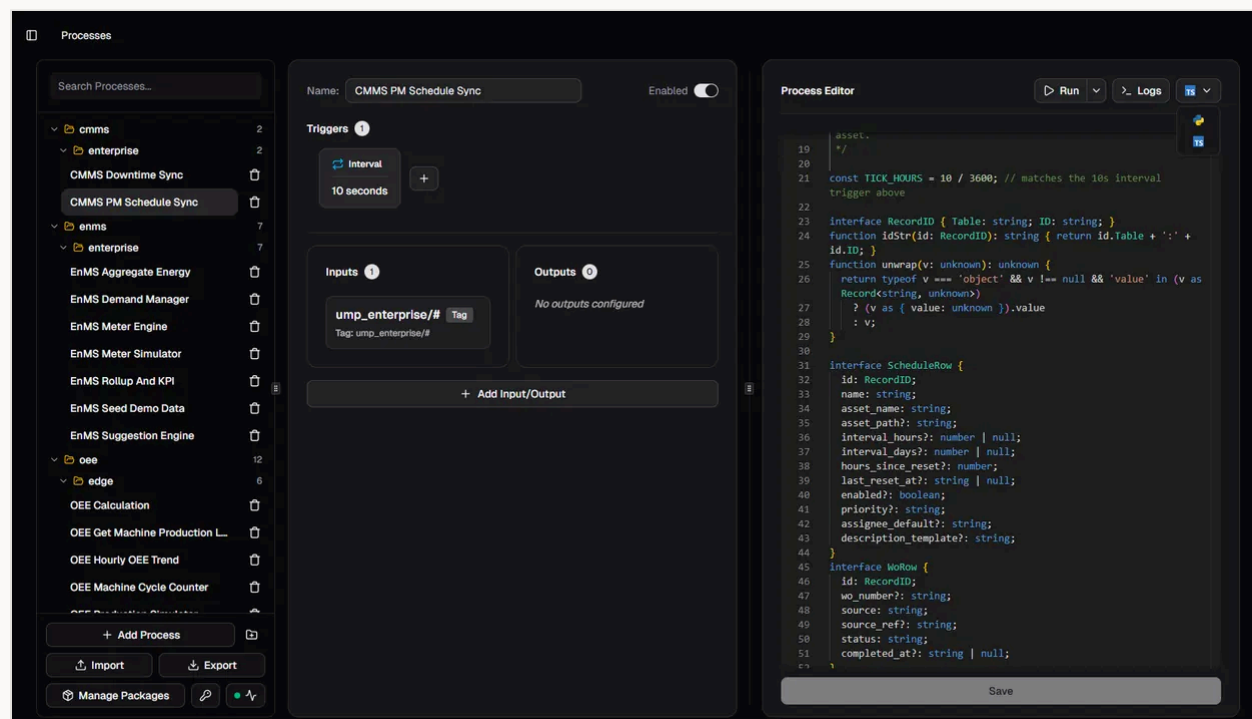
Cron schedule, fixed interval, tag change, HTTP endpoint, or manual invocation

Inputs

Tag reads and SQL queries, resolved before the function body runs

Outputs

Tag writes and SQL writes, applied from the returned result



Processes

Search Processes...

- cmms
 - CMMS Downtime Sync
 - CMMS PM Schedule Sync**
- enms
 - EnMS Aggregate Energy
 - EnMS Demand Manager
 - EnMS Meter Engine
 - EnMS Meter Simulator
 - EnMS Rollup And KPI
 - EnMS Seed Demo Data
 - EnMS Suggestion Engine
- oee
 - edge
 - OEE Calculation
 - OEE Get Machine Production L...
 - OEE Hourly OEE Trend
 - OEE Machine Cycle Counter

+ Add Process

Import Export

Manage Packages

Process Editor

Name: CMMS PM Schedule Sync Enabled

Triggers: 1

- Interval: 10 seconds

Inputs: 1

- ump_enterprise/# Tag

Outputs: 0

No outputs configured

+ Add Input/Output

```

19 //
20
21 const TICK_HOURS = 10 / 3600; // matches the 10s interval
   trigger above
22
23 interface RecordID { Table: string; ID: string; }
24 function getIdStr(id: RecordID): string { return id.Table + ':' +
   id.ID; }
25
26 function unwrap(v: unknown): unknown {
27   return typeof v === 'object' && v !== null && 'value' in (v as
   Record<string, unknown>)
28     ? (v as { value: unknown }).value
29     : v;
30 }
31
32 interface ScheduleRow {
33   id: RecordID;
34   name: string;
35   asset_name: string;
36   asset_path?: string;
37   interval_hours?: number | null;
38   interval_days?: number | null;
39   hours_since_reset?: number;
40   last_reset_at?: string | null;
41   enabled?: boolean;
42   priority?: string;
43   assignee_default?: string;
44   description_template?: string;
45 }
46
47 interface WoRow {
48   id: RecordID;
49   wo_number?: string;
50   source: string;
51   source_ref?: string;
52   status: string;
53   completed_at?: string | null;
54 }
55

```

Save

A process with its trigger, inputs and outputs beside the editor. Python and TypeScript are both supported, each with their own package dependencies.

Application development

Panel and above ship a full application stack: a runtime on the node, a typed SDK, and a VS Code extension that connects your editor to a live instance.

App Runtime

Serves your application from the node, inside an isolated application domain with its own data boundary.

TypeScript SDK

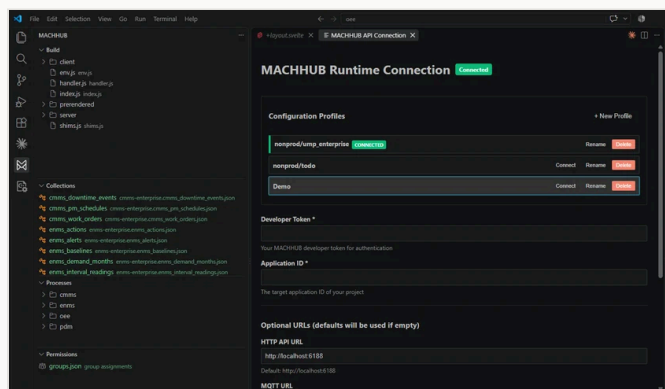
Typed client for collections, tags, authentication, authorisation, files, real-time subscriptions and process invocation.

MACHHUB Designer

VS Code extension that points a local project at a running instance and configures the SDK connection for you.

FRAMEWORK SUPPORT

Svelte	Svelte 5 and SvelteKit: runes, stores, load functions and form actions
React	Next.js App Router, server and client components, React hooks
Vue	Nuxt 3 and Vue 3: composables, plugins and middleware
Angular	Services, dependency injection and RxJS patterns



The extension connected to a live instance

Real-time by subscription

Applications subscribe to tag changes and MQTT topics, including wildcards, rather than polling the API for values that may not have moved.

Historian access

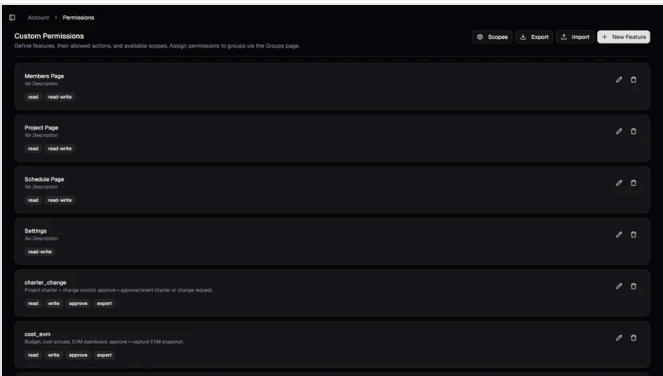
Ranged and aggregated historian queries are available to applications directly, with CSV export for analysis off the node.

Security & administration

Identity, access and recovery are configured on the node, so a deployment can meet plant IT requirements without an external dependency.

IDENTITY AND ACCESS

Users and groups	Local accounts organised into groups, with group membership driving what a user may reach
Permissions	Access declared per feature and scope, editable in the interface and importable as JSON for repeatable setups
Developer keys	API tokens for machine-to-machine access, issued and revoked separately from user accounts
Sessions	JWT-based authentication for the interface and the SDK



Permissions are declared per feature and scope rather than by broad role, so an operator account can be given exactly the dashboards and tags it needs and nothing else. The same declaration imports as JSON, which makes a permission scheme repeatable across sites instead of rebuilt by hand on each one.

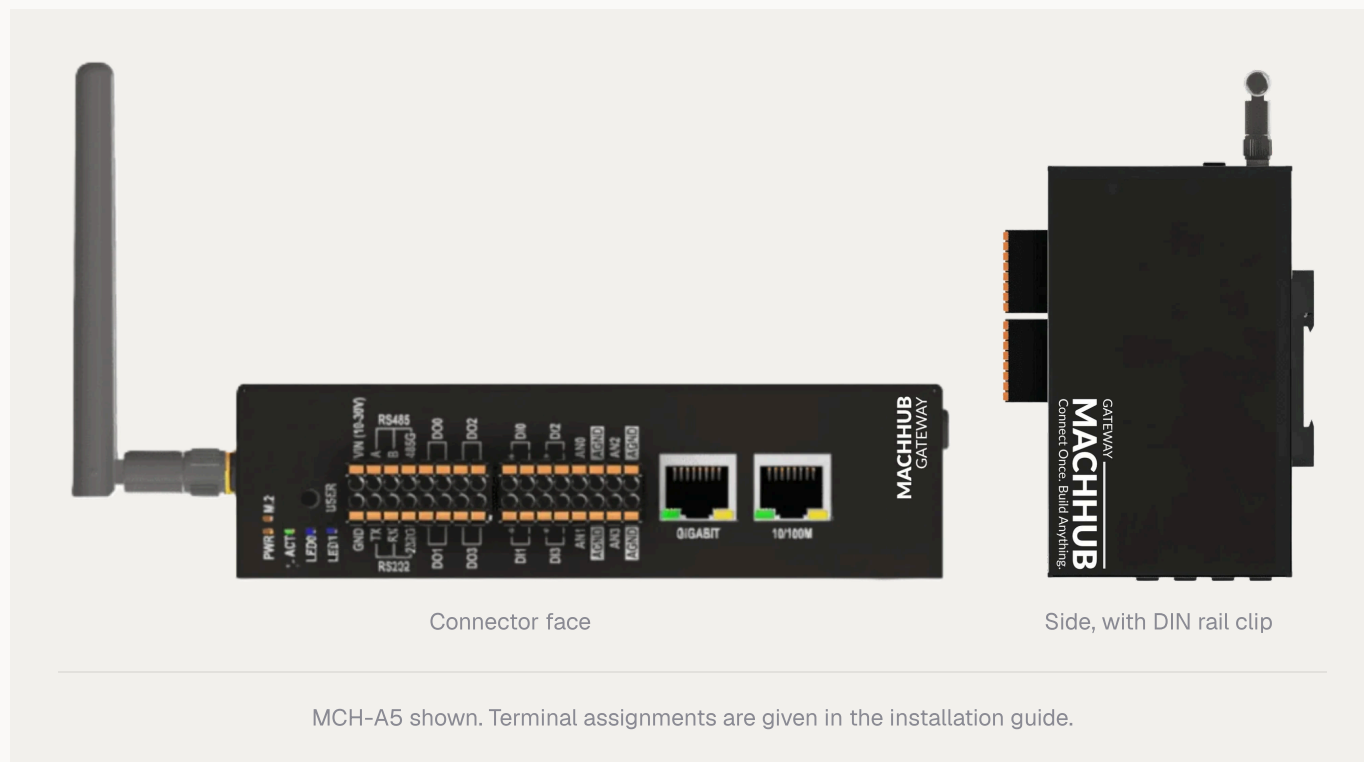
Features with their allowed actions and scopes

OPERATIONS

Backups	Scheduled backup and restore, with managed off-device destinations over SFTP so a copy survives the hardware
Firewall and network	Host firewall and network configuration, including Wi-Fi, from the settings interface
Logs	Application logs viewable on the node, with a support bundle for escalation
Licence	Current role, enabled modules and limits shown in the interface; role changes apply by swapping the licence file

MACHHUB Gateway

A fanless industrial computer for running **MACHHUB** on the plant floor. Metal enclosure, DIN rail mount, isolated field I/O and 10–30 V industrial power, in a box that fits a control cabinet.



Isolated field I/O

4× digital in and 4× digital out, isolated to 50 V. 4× analog in accepting 0–5 V, 0–10 V or 0–20 mA.

Serial and fieldbus

RS-232 plus isolated RS-485 for legacy PLCs and meters. Mini PCIe slot for expansion.

Built to sit in a cabinet

141.2 × 83.5 × 39.5 mm on standard DIN rail. Hardware real-time clock and a secure element for device identity, both on board.

Specification

WHERE THE SERIES DIFFER

	MCH-A SERIES	MCH-A5 SERIES
Processor	Broadcom BCM2711	Broadcom BCM2712
CPU	Quad-core Cortex-A72 1.5 GHz	Quad-core Cortex-A76 2.4 GHz
RAM options	4 GB · 8 GB	8 GB · 16 GB
Storage options	32 GB	32 GB · 64 GB

COMMON TO BOTH SERIES

Operating system	Raspberry Pi OS	Expansion	1× Mini PCIe (USB 2.0 + SPI)
Wireless	2.4 / 5.0 GHz Wi-Fi, BT 5.0 + BLE	Power supply	DC 10–30 V, surge protected
Ethernet	1× GbE + 1× 100 Mbps	Real-time clock	PCF85063A
USB	2× USB 2.0 + 1× USB-C	Secure element	ATECC608B
HDMI	1× HDMI 2.0	Display	0.96" OLED (SSD1306)
Digital I/O	4× DI + 4× DO, isolated to 50 V	Enclosure	Metal, fanless, DIN rail mount
Analog input	4× AI at 0–5 V, 0–10 V or 0–20 mA	Dimensions	141.2 × 83.5 × 39.5 mm
Serial	1× RS-232 + 1× RS-485, isolated	Warranty	12 months

MODELS

MODEL	RAM	STORAGE
MCH-A-W432	4 GB	32 GB
MCH-A-W832	8 GB	32 GB
MCH-A5-W0832 RECOMMENDED	8 GB	32 GB
MCH-A5-W1664	16 GB	64 GB

Hardware is ordered separately from the **MACHHUB** licence. Contact us for current pricing and lead times.

Evaluate it on your own plant data

Every edition runs fully featured for two hours at a time, restartable as often as you like, with no licence key and no registration. Install it on a spare machine, point it at a live PLC and judge it against your own tags.

01

Prove the data path

Connect a driver, historise a tag, put it on a dashboard. Two hours is enough to know whether it reads your equipment.

02

Size the deployment

Tell us the tag counts, sampling rates and retention you need, and how many nodes report to a Hub. We will size the roles with you.

03

Deploy

Run on your own hardware, or on a **MACHHUB** Gateway built for a control cabinet.

TALK TO US

contact@machhub.dev

+603-8071 6022

machhub.dev

Download the trial



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notice.