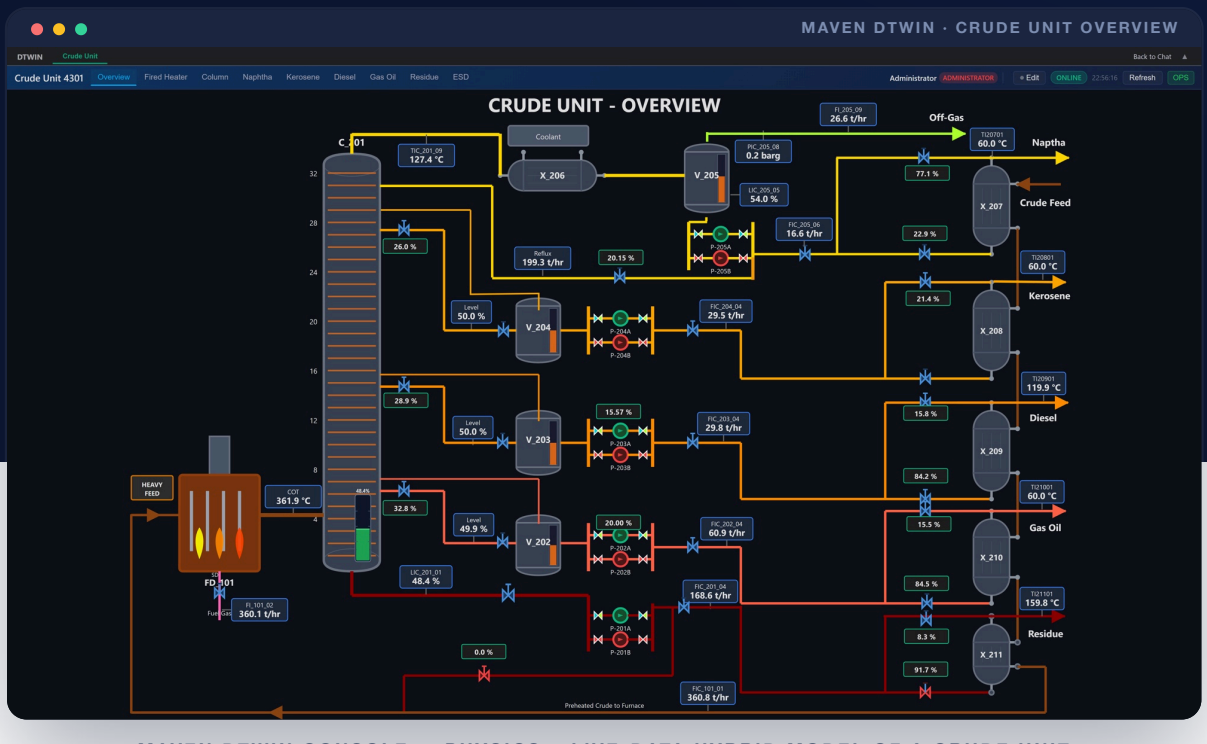
MAVEN DTWIN · DIGITAL TWIN OF YOUR PROCESS

MavenDTWIN

Digital Twin for Process Operations

MAVEN DTWIN combines **first-principles process models with live plant data** to deliver a high-fidelity digital twin of distillation columns, reactors, fired heaters, exchangers, compressors and rotating equipment. Engineers run what-if scenarios, validate control strategies offline, prototype start-up sequences and train operators against the same physics that drives the real plant — **without risking production**.



MAVEN DTWIN CONSOLE — PHYSICS + LIVE-DATA HYBRID MODEL OF A CRUDE UNIT

Hybrid	**OTS**	**0 risk**	**8–16 wks**
first-principles physics + ML correction	operator training simulator, ready out of the box	to production — validate offline first	commissioning per process unit

AT A GLANCE

- First-principles + ML hybrid model for high fidelity
- Operator training simulator (OTS) ready out of the box
- What-if & scenario library across process upsets
- Offline control-strategy validation
- Plant-data calibration for online accuracy
- Vendor-neutral DCS / SCADA tag bridge

PART OF THE MAVEN PLATFORM

APM	DTWIN	mAvenIt
Asset Performance Mgmt	First-Principles Based Digital Twin	Intelligent AI Assistant

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KEY CAPABILITIES

01	**Hybrid physics + ML models**	Rigorous first-principles models for unit operations, augmented with ML correction layers trained on plant history — online accuracy without sacrificing extrapolation.
02	**Operator training simulator**	Full OTS mode with start-up, shut-down, normal and upset scenarios. Trainee performance scoring and incident replay build operator competency safely.
03	**Scenario & what-if library**	Pre-built scenarios for feed swings, equipment trips, controller failures and grid events. Test responses without touching the live plant.
04	**Offline control & recipe validation**	Run advanced controllers against the twin in closed loop to validate tuning, constraint maps and recipe transitions before deploying online.
05	**Live-data calibration**	Online parameter estimation keeps the twin aligned with plant conditions, drift and fouling — so models stay trustworthy month after month.
06	**Inline mAvenIt insight**	Engineers ask mAvenIt for scenario explanations, bottleneck causes and tuning advice directly within the twin — bridging operator and process-engineering insight.

INPUTS & OUTPUTS

INPUTS

- DCS / SCADA tags via OPC UA, OPC DA or Modbus TCP
- PFDs, P&IDs and equipment data sheets
- Online analyser feeds (GC, IR, density, viscosity)
- Lab data and historian time-series
- Thermodynamic / kinetic property packages
- Exchanger geometry and fouling data

OUTPUTS

- Live and projected unit performance KPIs
- Scenario, what-if and OTS session reports
- Offline controller tuning and validation results
- Heat & mass balance reconciliation reports
- Energy and emissions intensity benchmarks
- Open APIs for downstream BI / engineering systems

DEPLOYMENT

MAVEN DTWIN is delivered as a containerised application running on-premises or in a private cloud, with optional offline workstation builds for engineering and training. Typical commissioning is eight to sixteen weeks per process unit — model build, plant-data calibration, scenario authoring and operator-trainer hand-over.

- Single-tenant, customer-owned data — no shared cloud database
- Standards-based DCS / SCADA integration via OPC UA
- Offline-capable workstation builds for engineering and OTS
- Online twin read-only by default; closed loop needs role-based authorisation

WHY MAVENPROTECH

Process-grade engineering

Built by industrial process-control engineers — the same APM, twin and AI core used across oil & gas, chemicals and metals. Not a generic simulation shell.

Vendor-neutral

Works with any DCS, SCADA, PLC or historian through open standards. No mandatory swap-out and no proprietary firmware.

Auditable, on-prem, private

Every scenario, calibration and training session is logged. Plant data stays inside your boundary — suited to regulated sites.

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