intelycx

EXECUTIVE WHITE PAPER



THE MID-MARKET MANUFACTURER'S GUIDE TO

Machine connectivity: speed vs. complexity

This whitepaper examines why mid-market manufacturers need a different connectivity approach than enterprise players, and how to evaluate machine connectivity software without getting locked into a multi-year implementation

01 / EXECUTIVE SUMMARY

Enterprise playbooks, mid-market plants.

Connectivity should be measured in weeks to value, not years to go-live.

A mismatch in scale

Mid-market manufacturers are being sold connectivity programs designed for companies ten times their size. The result is predictable: long integration projects, consultant dependency, and dashboards that arrive after the business case has gone stale.

What the plant actually needs

A plant with 20 to 300 machines, a two-person IT team and a mixed fleet of equipment from four decades does not need a multi-year digital transformation program to see its own OEE. It needs live, trustworthy machine data in weeks, a clear path to payback inside the fiscal year, and an architecture it can expand or exit on its own terms.

What this paper covers

This paper sets out why the enterprise playbook breaks down in the mid-market, how to frame the trade-off between speed and complexity, a practical checklist for evaluating vendors, and a 90-day roadmap. It closes with how Intelycx CORE was built to deliver enterprise-grade connectivity on a mid-market timeline.

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THE MEASURE THAT MATTERS

Time to first data. Time to first decision. Time to payback.

02 / THE MID-MARKET REALITY

The mid-market is not a smaller enterprise

Different constraints should shape the technology choice from the first conversation.

How enterprises buy connectivity

Enterprise manufacturers approach connectivity as a platform decision. They have central OT architecture teams, multi-year transformation budgets, systems integrators on retainer, and the patience to standardize dozens of plants before anyone sees a result. The cost of a slow start is absorbed across a large portfolio.

Why the mid-market is different

Mid-market manufacturers operate under a different set of constraints, and those constraints should shape the technology choice from the first conversation.

EXHIBIT 1

Five constraints that separate the mid-market from the enterprise

CONSTRAINT	ENTERPRISE REALITY	MID-MARKET REALITY
People	Dedicated OT, data and integration teams	A lean IT group and a controls engineer who also runs maintenance
Equipment	Standardized fleets and capital refresh cycles	Machines from multiple decades and vendors, some with no network port at all
Budget	Multi-year transformation programs	Operating budget that must show payback within the year
Downtime tolerance	Planned outages for system cut-overs	Lines run continuously; installs cannot stop production
Decision cycle	Committees, RFPs, phased gates	A plant manager, a CFO and a short window of attention

03 / WHERE THE PLAYBOOK BREAKS

Four ways enterprise programs stall

When a mid-market plant adopts an enterprise-style connectivity program, four failure patterns tend to appear.

1 **Integrator dependency**

Every new machine, tag or report becomes a change order. The plant cannot extend its own system, so it stops extending it.

2 **Custom development before value**

Months are spent building data models and bespoke dashboards before the first operator sees a live machine state.

3 **Big-bang scope**

The project tries to connect everything at once. Legacy machines become the long tail that delays go-live for the whole site.

4 **Rip-and-replace pressure**

Older controllers are deemed "unsupported," and the connectivity budget quietly turns into a capital equipment budget.

Complexity the plant cannot staff

Each pattern adds complexity that the mid-market cannot staff. The project does not fail outright. It stalls, loses its sponsor, and the plant returns to whiteboards and spreadsheet OEE.

THE PATTERN

The project does not fail outright. It stalls.

04 / SPEED VERSUS COMPLEXITY

Speed vs. complexity is a design choice

The trade-off is set by architecture, not by ambition.

A false trade-off

Speed and depth are often presented as a trade-off: deploy quickly and get shallow dashboards, or invest heavily and get a real data foundation. In practice the trade-off is set by architecture.

Fast without being shallow

A platform that ships with broad protocol coverage, an edge layer that handles legacy hardware, and preconfigured production KPIs can be fast without being shallow.

EXHIBIT 2

Measure speed with three clocks

Each clock is tied to a business outcome.

CLOCK 1

Time to first data

How long until a live machine state streams from the floor.

Target

Days

CLOCK 2

Time to first decision

How long until a supervisor acts differently because of that data.

Target

Weeks

CLOCK 3

Time to payback

How long until recovered uptime and capacity cover the cost.

Target

This fiscal year

05 / EVALUATING VENDORS

How to evaluate machine connectivity software

Use these eight questions in every vendor conversation. The red flags are the answers that predict a multi-year implementation.

EXHIBIT 3

The vendor evaluation checklist

ASK THE VENDOR	RED FLAG
1. How long until our first machine streams live data?	Answer is measured in quarters, or depends on a discovery phase
2. How do you connect machines with no network interface?	"We recommend upgrading the controller"
3. Which protocols are supported out of the box?	OPC UA, MQTT, Modbus or REST require custom work
4. Do we need a third-party integrator?	Yes, for installation and every later change
5. Are OEE and downtime reporting preconfigured?	KPIs are built per customer during the project
6. Does installation interrupt production?	Requires line shutdowns or controller reprogramming
7. How does it work with our ERP and MES?	Positioned as a replacement for systems that already work
8. Can we start with one line and expand?	Minimum commitment covers the whole site or multiple years

06 / AVOIDING LOCK-IN

Avoiding multi-year lock-in

Lock-in rarely arrives as a single contract clause.

How dependency accumulates

Lock-in accumulates through proprietary data formats, integrator-owned configurations and scope that only makes sense at full scale.

Keeping the plant in control

Four safeguards keep the plant in control of its data, its configuration and its pace of expansion.

EXHIBIT 4

Four safeguards against lock-in

1. **Open protocols at the edge**
   Data should move over industry standards such as OPC UA, MQTT and REST so it can feed other systems later.
2. **A unified namespace you own**
   Normalized machine data in a consistent structure is an asset; a vendor-specific schema is a dependency.
3. **A pilot with defined exit criteria**
   Agree up front which KPIs, machines and timeline define success, and what happens if they are not met.
4. **Modular expansion**
   Add lines, plants and capabilities as value is proven, rather than pre-buying the full roadmap.

THE PRINCIPLE

Normalized machine data is an asset. A vendor-specific schema is a dependency.

07 / INTELYCX CORE

Enterprise-grade connectivity on a mid-market timeline

A turnkey machine connectivity and real-time analytics platform, designed around the constraints in this paper.

One platform, every machine

Intelycx CORE unifies legacy and modern machines without third-party integrators. It streams high-frequency signals from the shop floor to the cloud in near real time, giving teams immediate visibility into OEE, machine health and throughput.

Days, not months

Deployment takes days, not months, through Intelycx Nano Edge and an edge-to-cloud architecture. CORE scales line by line without rip-and-replace projects, and complements existing ERP and MES rather than replacing them.

EXHIBIT 5

Reported outcomes

Outcomes as reported by Intelycx across customer deployments. Results vary by site.

DOWNTIME

Up to 20%

Reduction in unplanned machine downtime

CAPACITY

10–15%

Of previously constrained production capacity released

RESPONSE

20–30%

Faster response to production bottlenecks via real-time OEE alerts

CUSTOMER EVIDENCE

MEDICAL DEVICE OEM

20% less downtime in six months.

CORE replaced a time-intensive weekly OEE data collection cycle with a continuous, automated dashboard. Predictive maintenance alerts on critical CNC machining centers, which had previously failed without warning, helped the facility reduce machinery downtime by 20% within the first six months.

07 / THE CORE OPERATING MODEL

Every machine. One living system.

Five connected layers move your team from factory signals to accountable operational action.

Connect and contextualize

Intelycx Nano Edge and our edge-to-cloud architecture connect existing equipment. We assess the interface and signals each asset exposes, then align asset identity, timestamps, states, counts, and production context.

Make performance visible

CORE provides visibility into OEE, machine health, and throughput, with configurable dashboards and monitoring across facilities. Build views around decisions: operator response, supervisor priorities, engineering loss analysis, and executive performance review.

Close the loop

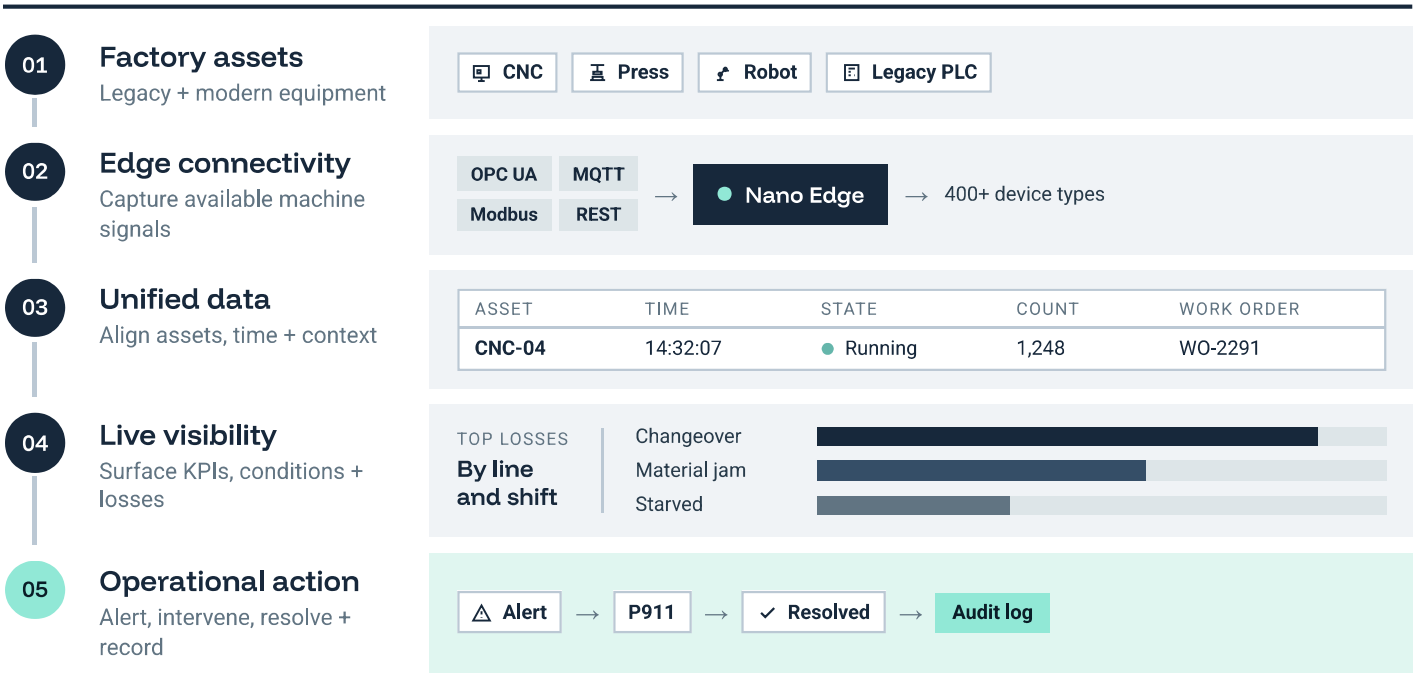
CORE supports alerts, notifications, workflow automation, P911 interventions, and automated audit tracking. A dashboard earns its place when it changes the response to a real production loss.

Build the foundation for what comes next

CORE establishes the data infrastructure that can be paired with AI tools such as ARIS, through interfaces such as OPC UA, MQTT, Modbus, and REST, with a shared structure for normalized data.

EXHIBIT 6

From machine signal to verified fix



↺ 05 → 03 **Closed loop.** Each recorded intervention feeds back into the data layer, so the team can verify whether the problem returns.

07 / INTELYCX CORE CAPABILITIES

Every machine. One living system.

Eight capabilities that answer the vendor checklist.

EXHIBIT 7

Intelycx CORE capabilities

Universal edge connectivity	The Intelycx Edge layer communicates with more than 400 device types, including PLCs, PACs, sensors and legacy controllers, capturing high- and low-frequency signals with ultra-low latency.
Nano Edge for legacy machines	Bridges analog and proprietary machines directly into the Edge layer, so older equipment is connected rather than replaced.
Open protocols	Integrates through REST APIs, OPC UA, Modbus, MQTT and other connectors across CNCs, PLCs, SCADA, test equipment and historians.
Unified namespace	Normalizes machine telemetry into a standard format and feeds live production data to ERP and MES, creating a single source of truth.
Preconfigured OEE and downtime	Throughput, downtime and OEE visibility without complex configuration or custom development, viewable by work order, part, machine, line or shift.
Edge intelligence	Lightweight ETL at the source reduces cloud processing cost; on-device machine learning raises defect and vibration alerts even without a cloud connection.
Act fast, stay compliant	P911 for urgent interventions and automated audit tracking, with traceability by lot, serial number or operation.
Flexible deployment	Available as PaaS or SaaS, with backup, failover and connection monitoring built in. Complements existing ERP and MES rather than replacing them.

BEYOND DASHBOARDS

From insight to action.

Intelycx CORE goes beyond data collection and dashboards. Alerts and notifications reach the right person the moment a condition changes. Descriptive, diagnostic and predictive analytics explain what happened, why it happened and what is likely to happen next. Integrated workflows then turn each insight into an assigned, tracked action, closing the loop from signal to resolution.

07 / THE VALUE STACK

A connected stack. A faster path to value.

Reduce implementation dependencies while preserving a clear path to analytics and future intelligence.

Start at the foundation

Each layer of value depends on the one beneath it. Machine connectivity comes first; cloud connectivity, enterprise integration, analytics, intelligence and agentic AI build on the same normalized data rather than on new projects.

Prove the next deployment

The second representative asset reveals whether the delivery model scales. Ask us to demonstrate the configuration effort, reusable mappings, and plant responsibilities. Expansion should reuse approved architecture and workflows while allowing for local differences.

EXHIBIT 8

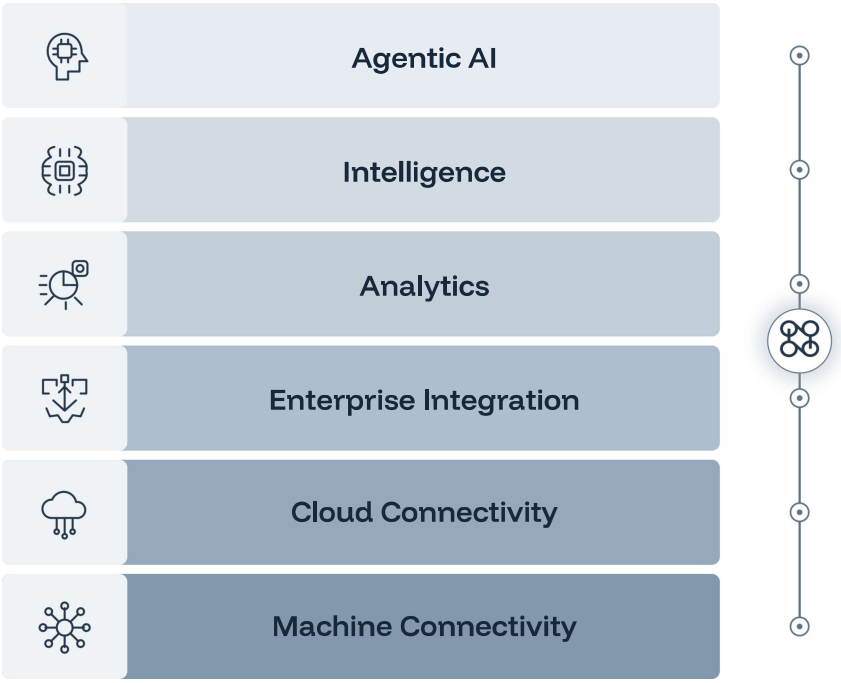
From machine connectivity to agentic AI

CUSTOMER TESTIMONIAL

BROWNFIELD SITE

100 machines connected in six weeks.

Global Digital Manufacturing Manager
Fortune 500 Med Device Manufacturer



08 / CUSTOMER EVIDENCE

Turn machine data into a better outcome

Our medical-device engagement shows how connectivity supports targeted engineering improvement.

The production challenge

Our customer faced an automated new-product line with recurring faults, quality rejects, and initial OEE of 30–40%. Existing SCADA information was siloed and required substantial analysis before it could guide a response. The challenge was turning equipment data into a useful explanation of performance.

The intervention

Gateways connected equipment PLCs to our cloud platform. Teams combined faults, quality-inspection data, sensor telemetry, and production KPIs, then used statistical analysis to investigate variability. Findings guided targeted engineering changes; live information helped validate those changes.

The reported result

Within a few months, our customer case documented uptime improving from the low 40s to above 80%, while scrap fell from over 30% to below 1%. These results included targeted engineering changes.

Apply the mechanism to your plant

For a recurring stop, examine the sequence of machine events and operating conditions. For a quality loss, connect rejects to equipment behavior and process settings. Prioritize a correction, record the change, and verify whether the problem returns.

EXHIBIT 9

Customer outcomes: two distinct measures

UPTIME

Low 40s → >80%

Before — After

SCRAP RATE

>30% → <1%

Before — After

09 / GETTING STARTED

A 90-day connectivity roadmap

Start with the machines that constrain output, prove value on one line, then expand. Each phase ends with a decision gate.

DAYS 1–14

Connect

Install edge hardware on bottleneck assets, including legacy machines. Stream live machine states.

Gate: data is live and trusted by the floor.

DAYS 15–45

Baseline

Standardize OEE, downtime reasons and scrap. Replace manual reporting with live dashboards and alerts.

Gate: an agreed baseline and top three loss drivers.

DAYS 46–90

Act and expand

Target the loss drivers, measure recovered uptime, connect ERP or MES, and extend to the next line.

Gate: measured gain against baseline.

CONCLUSION

Remove the trade-off

Mid-market manufacturers do not have to choose between a fast, shallow tool and a deep platform that takes years to deliver. The right architecture removes the trade-off: broad protocol coverage, an edge layer built for legacy equipment, preconfigured production KPIs, and open data the plant owns.

Start on one line

Evaluate vendors on time to first data, time to first decision and time to payback. Start on one line, with clear exit criteria, and expand only as value is proven.

See your machines live in weeks, not years.

Book a CORE connectivity assessment at intelycx.com.



CONNECTING THE PHYSICAL AND DIGITAL WORLD

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Every minute of every day.

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