



SERVICE BRIEF

Upgrades, Modifications and Integration

Keep your plant running and make it better: modern controls, new functions, new equipment.



Control system engineering, integration and analytics since 1997
ISO 9001 certified • Cyber Essentials • CHAS • Constructionline • SafeContractor

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THE CHALLENGE

A plant that has outgrown its controls

Most plants run on control systems older than the people who now maintain them. Spares get harder to find, the code is hard to follow, and every new machine or process change has to be squeezed into a system never designed for it. Replacing everything at once is rarely affordable, and production cannot stop for long.

Obsolete hardware

Controllers, panels and networks past the end of their support. One failure could mean a long stop while scarce spares are found.

Little documentation

The code works, but nobody fully knows how. Drawings and I/O lists no longer match what is installed.

Short outage windows

The plant has to keep producing. Upgrades must fit into planned shutdowns, with a way back if anything goes wrong.

New equipment to integrate

New machines, instruments, drives, robots and vision systems each come with their own controls, and they all have to work together.

AT A GLANCE

CONTROLLERS

PLC, DCS and safety

From obsolete controllers to current ones, on the same platform or a new one.

DISCIPLINES

Process to vision

Process, mechanical, electrical, instrumentation, drives, robots, vision and safety.

DELIVERY

Phased around you

Staged changes, tested in simulation, cut over in your outage windows, with rollback.

OUR ANSWER

Upgrade in steps you can afford, without losing what works or the production you depend on.

We start by finding out what you really have: hardware, versions, code and documents. Then we plan the upgrade around your production: what to replace, what to keep, and in which outage. Existing logic is analysed and carried across, not guessed at; new functions and equipment are engineered in, and every change is tested before it reaches site.

WHAT WE OFFER

The upgrades we deliver

From a single new function to a complete control system replacement, on existing plant or new, across every discipline that meets the control system.

UPGRADE 01

Controller migrations

Obsolete PLCs and controllers replaced by current ones: for example Siemens S7-300 and S7-400 to S7-1500, STEP 7 Classic to TIA Portal, or older Rockwell controllers to ControlLogix. Code is converted and reviewed, not just copied.

UPGRADE 02

Software and firmware upgrades

Engineering projects, firmware and SCADA brought up to supported versions, such as older TIA Portal projects to the current release, with every version archived and under version control.

UPGRADE 03

HMI and SCADA modernisation

End-of-life operator panels and SCADA replaced. Screens, alarms, trends and scripts are carried across and tested against the PLC before the old system is switched off.

UPGRADE 04

Functionality upgrades

New modes, sequences, recipes, reporting and data added to a system that already runs, without rewriting the parts that work.

UPGRADE 05

Modifications and extensions

New lines, machines and equipment added to an existing system, or a new system tied into the old. Each change is engineered, tested and made under change control.

UPGRADE 06

Integration across disciplines

Process, mechanical, instrumentation, drives, robots, vision and safety brought into one control system, with every interface agreed, documented and tested.

PHASED UPGRADES

It does not have to happen all at once

Many upgrades are best done in stages: SCADA first, then controllers line by line, then new functions. We plan the stages with you so that each one leaves the plant fully working and documented, and the next one is ready to start.

EXISTING AND NEW SYSTEMS

Upgrade what you have, or add something new

Most projects do both: an existing system is modernised while new equipment is added to it. Each side needs a different kind of care.

Upgrading an existing system

Production depends on it. We change it without losing what it does today.

- Survey of hardware, firmware and software versions
- A restorable backup of what runs today, before any change
- Code analysed and the missing documents recovered from it
- New system tested against the old system's behaviour
- Cut-over and rollback plan built around your outages

Adding new equipment or systems

New machines and packages arrive from many suppliers. We make them work as one plant.

- Interfaces agreed with each supplier before design
- Signals, limits and failure positions documented
- One standard for code, screens and alarms across the plant
- Interfaces tested in simulation before equipment arrives
- Integrated testing at factory and site acceptance

Integration across the plant

Discipline	What we integrate	How it is proven
Process	Control philosophy, loops, sequences and recipes, agreed with your process engineers	Sequence tests and process trials
Mechanical	Pumps, valves, conveyors, guards and pressure systems: signals, limits and failure positions	Interface and failure-position tests
Instrumentation	Transmitters, analysers, flow, weighing and level: ranges, scaling, alarms and trips	Loop checks and calibration records
Drives and motion	Variable speed drives, servos and motion over fieldbus, with parameters archived	Drive tests and parameter record
Vision and robots	Camera inspection and robot cells: triggers, results, rejects and recipes exchanged with the PLC	Handshake and reject tests
Safety	Emergency stops, guarding, safety PLCs and relays, to your safety requirements	Safety requirements tests, independently reviewed
Networks and data	PROFINET, EtherNet/IP, Modbus and OPC UA; links to historians, MES and ERP; segmented networks	Communications tests and network records

HOW WE DELIVER

From survey to supported system

Every upgrade follows the same path, whether it is one new function or a whole plant.

01 Survey

Hardware, versions, code and documents recorded; a backup of what runs today taken and proven restorable.

02 Recover

Existing code analysed, and the I/O list, alarm list and functional description recovered from it.

03 Plan

Upgrade path, stages, outage windows, cut-over and rollback agreed with you.

04 Engineer

Code converted or written, new equipment and functions engineered in, to your standards.

05 Prove

Tested against a simulated plant and the old system's behaviour, then factory acceptance.

06 Cut over

Installed in your outage, commissioned and site tested, then supported for the long term.

OUR ENGINEERING TOOLCHAIN

How our toolchain de-risks an upgrade

Archive intake

Older TIA Portal archives opened, upgraded to the current release and exported for review.

Document recovery

I/O, alarm and cause-and-effect lists produced from the code itself.

Code conversion

STEP 7 Classic statement list converted for S7-1500, with every rewrite marked for review.

Simulation

The upgraded program run in PLCSIM Advanced with simulated inputs before site.

Code analysis

Maps blocks, sequences, I/O and alarms, and flags faults before anything changes.

Version control

Every version and change kept, so you can see exactly what changed and why.

PROOF, NOT PROMISES

How we prove it

- Nothing changes on your running plant without a restorable backup of what runs today
- Converted code reviewed line by line, and tested against the old system's behaviour
- Every change staged from offline to simulation to live, each step signed off by a named engineer
- A cut-over and rollback plan agreed before the outage starts
- Deviations logged with their fix and retest; nothing closed silently

WHERE THE LINE IS

Nothing changes on your running plant without your permit to work, a restorable backup and sign-off at each stage. Converted code is a starting point that we review and test, not proof of identical behaviour. Equipment supplied by others is proven by its suppliers; we prove the interfaces.

WHAT YOU RECEIVE

An upgraded system you can support

✓ Survey and asset and version inventory

✓ Upgrade plan with stages and outages

✓ Cut-over and rollback plan

✓ Functional design specification

✓ I/O list and cause-and-effect

✓ FAT and SAT protocols and records

✓ As-built drawings and source code

✓ Backup and restore arrangement

✓ Training and fault method statements

QUESTIONS CUSTOMERS ASK

Do we have to replace everything?

No. We can upgrade in stages, keep what works, and plan each stage around your production.

We have no documentation. Is that a problem?

No. We recover the I/O list, alarm list and a functional description from the code before we change it.

What if something goes wrong on the day?

Every cut-over has a rollback plan and a proven backup, so the old system can be restored.

ABOUT MATRIX

Standards-led, fully documented control systems that you own and can support.

Matrix International (UK) Ltd has designed, built and supported industrial control systems since 1997. We take projects from specification and electrical design, through PLC, DCS and SCADA software, to installation, commissioning and long-term support, and we build the analysis software that shows how a plant is really performing. We are ISO 9001 certified and hold Cyber Essentials, CHAS, Constructionline and SafeContractor accreditation.

Siemens TIA Portal, S7 and PCS 7 • Rockwell • ABB • Schneider • Mitsubishi • Beckhoff • Emerson DeltaV • Honeywell • GE • WinCC, Ignition, AVEVA (Wonderware), FactoryTalk, iFIX and Citect SCADA

Talk to us about your upgrade

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