

CHECKLIST • 29 CHECKS • 6 SURFACES

Machine Retrofit & Connectivity Checklist

What to verify before you change a running machine's controls, or connect it to anything.



Write down what the machine does before anyone changes it



Know which safety functions the job touches, on paper first



Read data before you write it, and ask a question of it

29

CHECKS

6

SURFACES

1

WAY BACK, WRITTEN DOWN

02 HOW TO USE THIS CHECKLIST

This is for a machine that already runs and earns its keep: a press, a filler, a conveyor line, a test stand. Nothing here is about choosing a new PLC brand or designing a line from scratch.

It is about the gap between "the machine works" and "we can safely change it". Most retrofits that go wrong do not fail on the new hardware. They fail on something nobody wrote down about the old.

Work through it before you ask anyone for a quote, and again before the cutover. The first pass tells you what the job is; the second tells you whether you are ready to do it.

29 Checks across six surfaces	1 Upload from the controller, every time	0 Safety changes by accident
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SIX SURFACES

 What the machine does today The cycle, every mode, every fault, drawings checked against the panel, numbers measured now. 5 CHECKS	 The controller and its program Parts identified, the running program uploaded and opened, drives and HMI's backed up, access in the plant's hands. 5 CHECKS
 Safety Every stop and interlock traced, hardwired versus PLC written down, a review where the law asks for one. 5 CHECKS	 Connecting, data, cutover Protocols known first, networks separated, read-only to start, questions before dashboards, a written way back. 14 CHECKS

The program on the machine is the only one that is true. Upload it before you trust any file.

THE CHECK MOST OFTEN SKIPPED

03 THE MACHINE, ITS PROGRAM, AND SAFETY

What has to be true before any wire moves. If these are not done, the retrofit is rebuilding a machine from memory.



1. What the machine does today

- ☐ A full cycle watched and written down, each step and the condition that moves it to the next
- ☐ Every operator mode listed, including setup, jog, manual override, cleaning and jam recovery
- ☐ Every fault the machine raises today, with what the operator does about it
- ☐ Electrical drawings checked against the panel, not assumed to match it
- ☐ Cycle time, throughput and scrap rate measured now, so the retrofit is judged against numbers



2. The controller and its program

- ☐ PLC, firmware version and every module identified by part number, with availability known
- ☐ The running program uploaded from the controller and stored off the machine, dated
- ☐ The upload opened in the programming software and confirmed complete
- ☐ Drive, servo, HMI and smart-sensor parameters backed up too
- ☐ Licences, passwords, cable and software version held by the plant, not one technician



3. Safety

- ☐ Every emergency stop, interlock, light curtain and two-hand control tested and traced
- ☐ Which safety functions are hardwired, and which pass through the PLC or a safety relay, written down
- ☐ The plan says plainly whether any safety function changes; if one does, it gets its own risk assessment
- ☐ In Ontario: checked whether the change needs a Pre-Start Health and Safety Review (Reg. 851, s. 7)
- ☐ Lockout points and energy sources, including air, hydraulics and stored energy, documented



4. Connecting it

- ☐ The protocols the controller already speaks are known before anyone buys a gateway
- ☐ The machine network separated from the office network, only needed connections allowed
- ☐ Nothing outside the plant reaches the controller directly; remote access through one logged path
- ☐ The first connection reads data only. Writing comes later, if at all, and on purpose
- ☐ Every address, tag and register documented with its units and scaling



5. The data you want

- ☐ The questions the data must answer written down first, not "collect everything"
- ☐ Each signal has a defined sample rate and a reason for it
- ☐ Machine states defined (running, idle, blocked, starved, faulted) and agreed with the readers
- ☐ Someone owns the screen or report, and an operator has seen it before it is called finished



6. The cutover

- ☐ The new program tested before it reaches the machine, in a simulator or on a bench rig with the real I/O map
- ☐ Every input and output checked point by point on the machine, with the result recorded
- ☐ A written way back; the old program and parts kept until a full production week has run
- ☐ The cutover booked into a production window with the people who run the line
- ☐ Operators and maintenance shown the new screens and fault messages before the first shift

WHERE THIS USUALLY GOES WRONG



The program on the machine is not the program in the file

The only copy is on an old laptop, and the machine has been edited online since. Retrofits built on that file reproduce a machine that no longer exists.



Safety rides along unnoticed

A guard switch wired through the old PLC moves to the new one, nobody reviews it, and a safety function changes without a risk assessment.



Connected before it is understood

A dashboard appears and nobody can say what the numbers mean or who acts on them. Data with no question behind it costs money to keep.

05 WHEN YOU NEED OUTSIDE HELP

Most plants can work through this list with their own maintenance team, and should. It is worth bringing in help when:



Nobody can say how the machine decides

The program cannot be read, the drawings do not match the panel, and nobody left on site knows how the machine actually decides what to do.



Obsolete parts, and no long shutdown

Parts are obsolete and the line cannot stop for longer than a planned shutdown, so the migration has to be staged around production.



Controls and IT have never met

Machine data has to reach an MES, an ERP or a cloud system securely, and the controls and IT sides of the plant have never had to work together.



If any of those describe where you are, this is work we do.

Write to contact@mnpsystems.ca. We will tell you quickly if we can help, and what a sensible next step looks like.