

Digital I/O test sheet

One signal per sheet. Three steps for an input, three for an output; the third one is the broken wire or the lost signal, and its expected state comes from the design, before the test.

TAG	I/O ADDRESS · CARD / CHANNEL	CONTACT TYPE · NO / NC	ACTIVE STATE	FAIL STATE (PER DS)
HMI TEXT (PER I/O LIST)	I/O LIST REVISION	METHOD · WHERE THE WIRE IS LIFTED	LINE MONITORING · YES / NO	

1 Digital input · operate the device at the field, never force the bit

STEP	EXPECTED (FROM THE I/O LIST)	PLC BIT OBSERVED	HMI TEXT OBSERVED	RESULT
1 Active · device operated	Bit = active state · HMI text as listed			☐ pass ☐ fail
2 Inactive · device released	Bit = inactive state · HMI text as listed			☐ pass ☐ fail
3 Wire disconnected at the terminal	The fail state per DS: alarm / trip / not healthy. Never "OK".			☐ pass ☐ fail

2 Digital output · force the output from the PLC, watch the device and its feedback

STEP	EXPECTED (FROM THE DS)	DEVICE OBSERVED	FEEDBACK OBSERVED	RESULT
1 Energised · output forced on	Device moves to the energised position · feedback agrees			☐ pass ☐ fail
2 De-energised · output forced off	Device returns · feedback agrees			☐ pass ☐ fail
3 Loss of signal · fuse pulled / PLC stopped	Device goes to the safe position the DS names: fails closed / open / as is			☐ pass ☐ fail

3 Line monitoring · only where the DS calls for it (NAMUR input, end-of-line resistor, safety I/O)

Two more states · each must raise the fault the DS specifies, not the alarm

- Wire break · loop current < 0.15 mA · fault observed: ☐ pass ☐ fail
- Short circuit · loop current > 6.5 mA · fault observed: ☐ pass ☐ fail
- Typical thresholds per EN 60947-5-6; the isolator's datasheet gives the exact ones.

Fail-safe, in one line

- The de-energised state is the safe state. A broken wire, a blown fuse and a dead supply all end there.
- Alarm and trip contacts open on alarm (normally closed, healthy when current flows).
- Trip outputs de-energise to the safe position (the valve closes, the pump stops).
- A step 3 that reads "OK" is a design discrepancy, not a step to re-run.

Discrepancy (number, description, design change, re-test): _____

Notes _____

EXECUTED BY · DATE · TIME

REVIEWED BY · DATE · TIME