

Industrial Automation HMI Display Design Checklist



10 customer questions to de-risk display selection for machines, PLC/SCADA panels, and production HMIs

How to use the checklist

For each question, capture the application context, the display requirement, the acceptance evidence, and any residual risk. Escalate any unknown response where the display affects safety, uptime, operator decision-making, regulatory evidence, or customer experience. Escalate any unknown response where the display affects machine control, alarm response, safety interlocks, production release, or maintenance access.

#	Customer design question	Why this matters	Evidence to request / acceptance criteria	Status / notes
1	What machine or process task must the display support, and what happens if the operator misreads it?	Connects optical and HMI choices to operational risk, machine state awareness, and safe response.	Task and alarm review; operator workflow; risk register entry; acceptance criteria for all critical screens.	OK / Gap / N/A
2	What environmental stresses will the display face: dust, oils, vibration, washdown, shock, or temperature?	Industrial HMIs often fail from enclosure mismatch rather than display image quality alone.	IP/IK target; vibration and shock profile; operating/storage temperature; contamination and cleaning assumptions.	OK / Gap / N/A
3	What mounting format, enclosure depth, and service access are available?	Open-frame, panel-mount, rack, VESA, or stainless designs require different tolerances and service routes.	Mechanical drawings; bezel/clip/fastener details; cable bend radius; service clearance and replacement procedure.	OK / Gap / N/A
4	What readability is required under factory lighting, glare, and wide viewing angles?	Operators may read status at distance, from off-axis positions, or under high-output LED lighting.	Luminance/contrast targets; anti-glare or optical bonding decision; viewing-angle validation; dimming requirements.	OK / Gap / N/A
5	Will the touch interface be used with gloves, tools, wet hands, or contaminants?	Poor touch tuning creates missed inputs, false activations, and avoidable downtime.	Glove and wet-touch trials; touch technology selection; palm rejection; confirmation logic for critical commands.	OK / Gap / N/A
6	Which electrical interfaces, control signals, and host platforms must be supported?	Display, touch, backlight, and embedded PC interfaces must align with the automation architecture.	Interface specification; cable lengths; EMC grounding plan; driver/OS support; PLC/IPC compatibility check.	OK / Gap / N/A
7	What duty cycle, backlight life, and long-term product availability are required?	24/7 production environments need stable lifetime and controlled obsolescence.	MTBF/life estimate; backlight derating; PCN/EOL process; spares strategy; last-time-buy plan if needed.	OK / Gap / N/A
8	How will the display behave during power loss, brownout, boot, restart, and fault conditions?	A blank, frozen, or misleading HMI can increase downtime or unsafe intervention.	Power sequencing review; watchdog/fault indication; boot-time requirement; recovery and diagnostic behaviour.	OK / Gap / N/A
9	How will the unit be cleaned, maintained, updated, and replaced without disrupting production?	Maintainability affects total cost of ownership and line availability.	Cleaning method; firmware/update plan; front-access or module swap process; spare parts list; production test coverage.	OK / Gap / N/A
10	What verification evidence proves suitability before machine build or site acceptance?	Industrial display requirements should be traceable to FAT/SAT evidence, not left as prototype preference.	Requirements matrix; inspection plan; environmental tests; operator acceptance trials; FAT/SAT criteria.	OK / Gap / N/A

Recommended review outputs

- Display subsystem requirements specification: optical, mechanical, electrical, environmental, touch, software-interface, mounting, and lifecycle requirements.
- Risk and application traceability: each display-related risk or customer-experience issue linked to a design control and verification method.
- Evidence pack: drawings, interface specifications, environmental assumptions, test reports, supplier declarations, support/lifecycle plan, and controlled change documentation.

Reference prompts for the project team

- Confirm all customer, site, and regulatory requirements before final specification or quotation.
- Define testable acceptance criteria for every requirement that affects readability, touch operation, reliability, safety, or maintainability.
- Record any assumptions on duty cycle, lighting, environmental exposure, mounting, electrical interfaces, content, and long-term availability.
- Review the final display selection jointly with mechanical, electrical, software, operations, service, and commercial stakeholders.

Use this checklist for control-room, field, kiosk, monitoring, inspection, and process-interface displays in oil, gas, and energy applications. This is a practical customer-discovery guide. Its is not a substitute for project-specific engineering, safety, legal, or compliance assessment, in conjunction with discussion with CDS engineers and/or technical sales team.

For more information or to discuss your project and requirements please contact our technical sales team