



EXAMPLE EXTERNAL DOCUMENTS AND STANDARDS DEVELOPERS FOR SYSTEMS INTEGRATORS

STANDARDS DEVELOPMENT ORGANIZATIONS

Industrial Automation & Control

Organization	Description	Sample Standards
ISA (International Society of Automation)	Develops standards for industrial automation and control systems.	ISA-88 (Batch Control), ISA-95 (Enterprise-Control Integration), ISA-62443 (Cybersecurity for IACS)
IEC (International Electrotechnical Commission)	Global body developing electrotechnical standards.	IEC 61131 (PLC programming), IEC 61508 (Functional Safety), IEC 62443 (Cybersecurity)
IEEE (Institute of Electrical and Electronics Engineers)	Publishes standards in electrical, electronics, and computer fields.	IEEE 802 (LAN/MAN), IEEE 1451 (Sensor interfaces), IEEE 1588 (Time sync)
NFPA (National Fire Protection Association)	Codes and standards related to electrical safety.	NFPA 70 (NEC - National Electrical Code)

Quality, Risk, and Management Systems

Organization	Description	Sample Standards
ISO (International Organization for Standardization)	Internationally recognized standards across sectors.	ISO 9001 (Quality), ISO 31000 (Risk), ISO 45001 (Health & Safety), ISO 27001 (Information Security)
ASQ (American Society for Quality)	Collaborates on quality-related standards and provides training.	Works with ANSI and ISO on QMS standards
IATF (International Automotive Task Force)	Automotive industry standards body.	IATF 16949 (Automotive QMS)

Cybersecurity & IT Standards

Organization	Description	Sample Standards
NIST (National Institute of Standards and Technology)	U.S. body creating cybersecurity and IT frameworks.	NIST SP 800-53, SP 800-82 (ICS Security), Cybersecurity Framework (CSF)
CISA (Cybersecurity and Infrastructure Security Agency)	U.S. DHS agency publishing cybersecurity guidance.	CISA advisories and best practices
ETSI (European Telecommunications Standards Institute)	European body for telecom and cybersecurity.	EN 303 645 (IoT Security)

Communications & Interoperability

Organization	Description	Sample Standards
OPC Foundation	Standards for secure, reliable interoperability in automation.	OPC UA (Unified Architecture)
ODVA (Open DeviceNet Vendors Association)	Network protocol standards for industrial automation.	EtherNet/IP, DeviceNet
FieldComm Group	Develops and maintains industrial communication protocols.	HART, FOUNDATION Fieldbus, FDI
Profibus & Profinet International (PI)	Develops open standards for fieldbus and Ethernet.	PROFINET, PROFIBUS



Listing Of Product-Specific Standards Frequently Used By Systems Integrators

I Programmable Logic Controllers (PLCs)

Standard	Title	Description	Organization
IEC 61131-3	PLC Programming Languages	Defines programming languages (Ladder, Structured Text, etc.) for PLCs.	IEC
UL 508 / UL 508A	Industrial Control Equipment / Panels	Safety requirements for industrial control panels and devices.	UL
NFPA 79	Electrical Standard for Industrial Machinery	Covers wiring and safety for control systems on machinery.	NFPA

II. Industrial Control Systems (ICS)

Standard	Title	Description	Organization
ISA-95 / IEC 62264	Enterprise-Control System Integration	Framework for integrating manufacturing and business systems.	ISA / IEC
ISA-88 / IEC 61512	Batch Control	Standard for batch process control, modular recipe design.	ISA / IEC
IEC 61508	Functional Safety of E/E/PE Systems	General functional safety standard for programmable systems.	IEC
IEC 62061	Safety of Machinery – Functional Safety	Safety systems design for machinery automation.	IEC
ISO 13849-1	Safety of Machinery – Control Systems	Performance level requirements for safety-related parts of control systems.	ISO

III. Cybersecurity for Industrial Systems

Standard	Title	Description	Organization
ISA/IEC 62443 Series	Security for Industrial Automation & Control Systems	A comprehensive framework for securing ICS and SCADA systems.	ISA / IEC
NIST SP 800-82	Guide to Industrial Control Systems Security	Cybersecurity guidance for ICS systems.	NIST
ISO/IEC 27001	Information Security Management System	Framework for securing IT and OT information assets.	ISO/IEC

IV. Industrial Communication Protocols

Protocol / Standard	Title	Description	Organization
OPC UA	Open Platform Communications – Unified Architecture	Platform-independent interoperability for automation.	OPC Foundation
PROFINET / PROFIBUS	Process Field Network / Bus	Ethernet-based (PROFINET) and serial (PROFIBUS) automation networks.	PI (PROFIBUS & PROFINET International)
EtherNet/IP	Industrial Ethernet Protocol	Standard for communication over Ethernet in industrial environments.	ODVA
Modbus RTU / TCP	Serial / Ethernet Protocol	Open communication protocol used in SCADA and PLCs.	Modicon (open standard)
HART	Highway Addressable Remote Transducer Protocol	Communication for smart field devices.	FieldComm Group
FOUNDATION Fieldbus	Industrial Network Protocol	Real-time distribution of control across the field layer.	FieldComm Group

V. Control Panels and Enclosures

Standard	Title	Description	Organization
UL 508A	Industrial Control Panels	Construction and safety of control panels.	UL
IEC 60204-1	Safety of Machinery – Electrical Equipment	General requirements for electrical equipment on machinery.	IEC



NEMA Standards	Enclosure Types, Ratings	Ratings for electrical enclosures (e.g., NEMA 1, 4X).	NEMA
IEC 60529	IP Code – Degrees of Protection	Ingress protection ratings (e.g., IP66).	IEC

VI. Instrumentation and Process Measurement

Standard	Title	Description	Organization
ISA-20	Instrument Specification Forms	Standardized spec sheets for instruments.	ISA
ISA-5.1	Instrumentation Symbols and Identification	Standard for process diagrams and instrumentation tags.	ISA

VII. Functional Safety & Machine Safety

Standard	Title	Description	Organization
IEC 61508	Functional Safety of Electrical/Electronic/Programmable Systems	Foundational safety standard for control systems.	IEC
IEC 62061	Safety Systems for Machinery	Functional safety in machinery control.	IEC
ISO 13849-1/-2	Safety of Machinery	Performance levels (PL) for safety systems.	ISO

VIII. System Engineering, Design, and Integration

Standard	Title	Description	Organization
ISO/IEC/IEEE 15288	System Life Cycle Processes	Framework for systems engineering and integration.	ISO / IEEE
CENELEC EN 50126/50128/50129	Railway Applications – System Safety	Applied in transportation systems, increasingly relevant for integrators in that sector.	CENELEC

IX. Quality and Management Systems

Standard	Title	Description	Organization
ISO 9001	Quality Management Systems	Foundational QMS standard.	ISO
IATF 16949	Automotive Quality Management	QMS standard for automotive suppliers.	IATF
API Q1/Q2	Oil & Gas QMS Standards	Quality standards for petroleum equipment and services.	API

X. Validation, Testing, and Documentation

Standard	Title	Description	Organization
GAMP 5	Good Automated Manufacturing Practice	Guidelines for validating automated systems in regulated industries (e.g., pharma).	ISPE
ISO/IEC 17025	Competence of Testing & Calibration Labs	Relevant when integrators run test labs.	ISO/IEC
IEEE 829 (Now ISO/IEC/IEEE 29119)	Software Testing Documentation	Defines software test plans, test cases, etc.	IEEE / ISO