

Low-Voltage System Technician Standards

46.0399

Standard 1.0 – Electrical Fundamentals

- 1.1 Define and apply electrical theory (voltage, current, resistance).
- 1.2 Apply Ohm's Law and power calculations to system design and troubleshooting.
- 1.3 Identify wire types, gauges, and color codes.
- 1.4 Follow NEC, NFPA, OSHA, and industry safety standards.
- 1.5 Demonstrate proper use of multimeters, strippers, tone generators, and labeling tools.

Standard 2.0 – Cable Management, Wiring, and Installation Practices

- 2.1 Identify cable types (CAT5e/CAT6, coaxial, 18/2, 22/4, plenum/riser).
- 2.2 Interpret basic blueprints to determine cable paths.
- 2.3 Demonstrate pulling, snaking, drilling, and routing techniques through framing, drywall, and finished walls.
- 2.4 Apply cable documentation and labeling standards.
- 2.5 Use cable-pulling tools (fish tape, rods, drills with flex bits, inspection cameras).

Standard 3.0 – Burglar Alarm Systems

- 3.1 Compare wired and wireless alarm systems.
- 3.2 Identify sensors (PIR, glass break, door/window contacts).
- 3.3 Install and program keypads, panels, and zones.
- 3.4 Configure basic system programming including partitioning and system testing.
- 3.5 Use software and meters to troubleshoot burglar systems.

Standard 4.0 – Surveillance & CCTV Systems

Students will install and configure video surveillance systems.

Performance Indicators

- 4.1 Compare analog vs IP cameras.
- 4.2 Identify camera types (bullet, dome, PTZ) and recording platforms (DVR/NVR).
- 4.3 Configure resolution, frame rate, and storage parameters.
- 4.4 Set up networks for IP camera deployment.
- 4.5 Mount, aim, and configure cameras and remote access settings.

Standard 5.0 – Fire Alarm Systems

Performance Indicators

- 5.1 Interpret and apply NFPA 72 fire code.
- 5.2 Compare addressable and conventional systems.
- 5.3 Install detectors, pull stations, horns, and strobes.
- 5.4 Program basic fire alarm loops and perform functional testing.
- 5.5 Use loop testers, alarm testers, and programming tools.

Standard 6.0 – Access Control Systems

- 6.1 Identify access hardware (maglocks, strikes, panels, readers).
- 6.2 Compare credential types (cards, fobs, biometrics).
- 6.3 Install wiring and power supplies.
- 6.4 Configure software, permissions, and schedules.
- 6.5 Install and test complete access systems.

Standard 7.0 – Networking for Low-Voltage Systems

- 7.1 Apply IP addressing, subnetting, and device configuration.
- 7.2 Configure switches, routers, VLANs, and device isolation.
- 7.3 Demonstrate proper PoE usage and testing.
- 7.4 Troubleshoot connectivity for cameras, access control, and system devices.
- 7.5 Use testers, Wi-Fi analyzers, and network laptops.

Standard 8.0 – System Integration & Capstone Project

- 8.1 Design multi-system solutions (CCTV + access + alarms).
- 8.2 Install, configure, label, and document end-to-end systems.
- 8.3 Troubleshoot integrated systems and perform client-style handoff.
- 8.4 Demonstrate jobsite communication and professionalism.
- 8.5 Prepare for optional certifications (NICET, ESA, BICSI).