

Can Power Cables And Instrumentation/Communication Cables Share The Same Cable Tray? A Comprehensive Guide For Engineers



Ningbo, Zhejiang Apr 7, 2026 ([IssueWire.com](https://www.IssueWire.com)) - In industrial and commercial projects, the integration of power, instrumentation, and communication systems is critical. A common question arises: **Can power cables and instrumentation/communication cables be run in the same [cable tray](#)?** This article explores technical standards, safety considerations, and best practice.

1. Technical Standards and Regulations

- **NEC (National Electrical Code) Article 300.3(C)(1):** Prohibits the mixing of power and low-voltage cables (e.g., control, communication) in the same raceway or tray unless specific separation or shielding requirements are met.
- **IEC 60364-5-52 (International Standard):** Recommends physical separation or shielding to prevent electromagnetic interference (EMI). **IEC 60364-5-52**

2. Risks of Mixing Power and Low-Voltage Cables

- **Electromagnetic Interference (EMI):** Power cables generate magnetic fields that can disrupt sensitive instrumentation and communication signals.
- **Voltage Induction:** High-voltage cables may induce dangerous voltages in nearby low-voltage circuits.
- **Fire Hazards:** Overheating from improper cable grouping can increase fire risks.
- Compliance with local electrical codes (e.g., NEC, IEC, BS 7671)
- Risk assessment for signal integrity and safety.

3. Solutions for Safe Co-Location

If mixing is unavoidable, follow these best practices:

- **Physical Separation:** Use dividers in the [cable tray](#) to create a minimum 30 cm gap between power and low-voltage cables.
- **Shielding:** Install shielded cables for low-voltage systems and ensure proper grounding.
- **Zoning:** Segregate power and control circuits in different sections of the tray.

4. Case Studies and Real-World Applications

- **Industrial Plants:** In manufacturing facilities, separate trays are often used for power and instrumentation to avoid EMI in PLC systems.
- **Smart Buildings:** Hybrid cabling with shielding and separation is common in integrated BMS (Building Management Systems).

5. Cost and Efficiency Considerations

- **Cost-Saving vs. Risk:** While separate trays increase material and labor costs, they reduce long-term risks of signal failure and safety hazards.
- **Modular Design:** Pre-engineered [cable trays](#) with dividers optimize space and compliance.

While it is technically possible to run power and low-voltage cables in the same tray under strict conditions, **segregation or shielding is strongly recommended** to ensure safety, compliance, and system reliability. Engineers should prioritize standards like NEC, IEC, and project-specific requirements when designing electrical infrastructure.

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