Technical Tip

VESDA/VESDA-E Ground Fault Considerations in VESDAnet Installations

June 2026

Overview

Ground fault monitoring is a critical safety requirement in many fire detection and Aspirating Smoke Detection (ASD) installations. When integrating VESDA-E detectors with VESDA-L series (VLP, VLS and VLC) devices on a shared VESDAnet communications network, differences in grounding design can lead to unexpected ground fault indications.

This technical tip explains why these faults occur, outlines compliant installation options and provides best practice recommendations for mixed VESDA-E and VESDA-L series networks.

Why Ground Faults Occur in Mixed VESDA-E and VESDA-L Series Networks

Legacy VESDA-L series detectors (VLP, VLS and VLC) incorporate chassis grounding as standard. Many remote accessories for these detectors (e.g. displays, programmers, relays) also share this grounding configuration. By contrast, VESDA-E detectors include an enhanced ground fault detection system designed to meet modern codes and installation practices.

When a VESDA-L series device with chassis ground is connected into a VESDAnet loop with a VESDA-E detector, the grounding reference can unintentionally complete a ground path, causing the VESDA-E unit to report a ground fault, even if no actual insulation fault exists.

This is an expected behaviour that results from the below reasons:

- Chassis grounded legacy equipment.
- VESDA-E active earth-fault monitoring.
- Shared reference potential across VESDAnet communication wiring.

Grounding Considerations for VESDA-E and VESDA-L Detectors

Option 1	Option 2
VESDA-L-Series Product Chassis Grounded *(Simple integration, but disables earth fault monitoring on VESDA-E)*	**VESDA-L Series Product Chassis Not Grounded** *(Preserves VESDA-E ground fault monitoring)*
If the VESDA-L series device is mounted as designed with chassis grounded, the VESDA-E detector will interpret the grounded reference as a ground fault. To avoid this fault, you must disable ground fault detection on the VESDA-E detector. **Important Note:** When ground fault detection is disabled, any real earth-leakage condition on VESDAnet will NOT be reported. This may not meet local codes or customer requirements. This option is suited for legacy system upgrades where the customer accepts the loss of earth-fault monitoring or where code does not mandate it.	If ground fault detection must remain enabled on the VESDA-E detector (often required by code), then the VESDA-L Series device must be isolated from building ground. This requires: 1. Mounting the VESDA-L series device on a non-conductive surface. 2. Ensuring that all the conduits entering the chassis are also isolated. 3. Verifying that no earth bonding occurs via: • Backboxes • Metalwork • Conduit glands • Accessory devices Once the VESDA-L series device is fully isolated from the ground, enable ground fault detection on the VESDA-E detector according to its user manual. This option maintains full ground fault monitoring capability across the VESDAnet network.

Option 1	Option 2
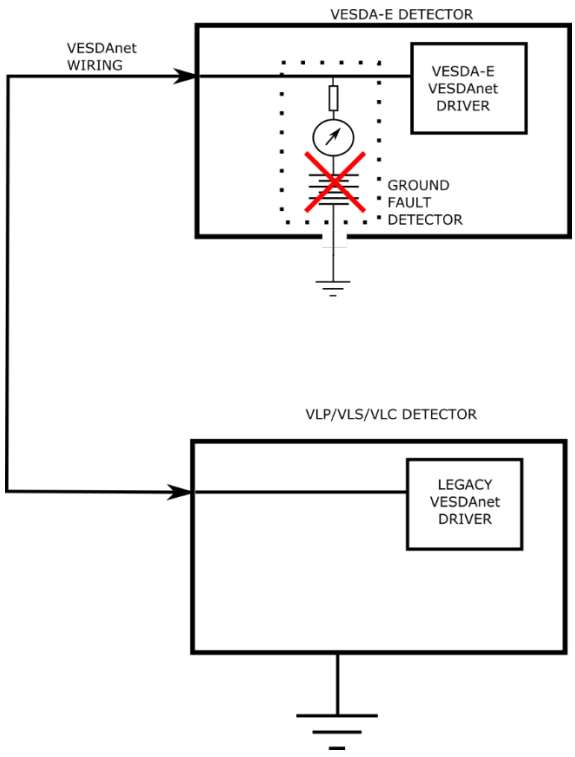	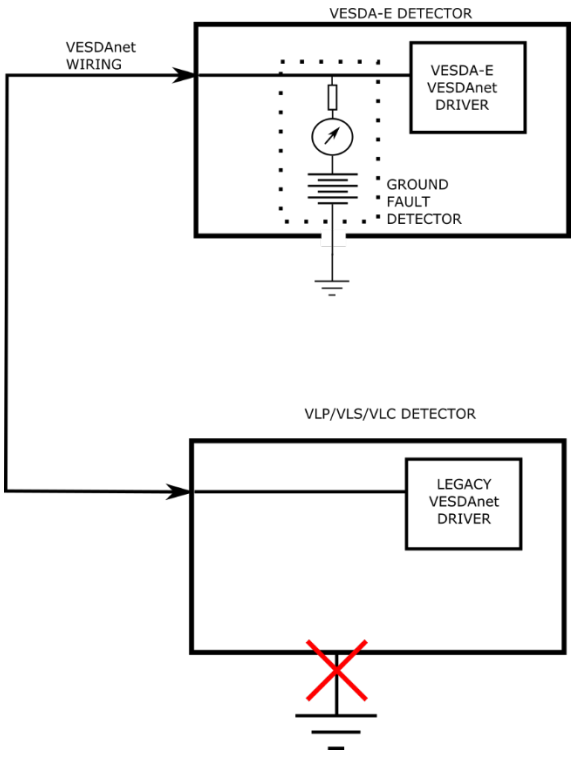
Figure 1: Connecting a legacy detector with a grounded chassis	*Figure 2: Connecting to a legacy detector with chassis isolated from ground*

Grounding Considerations for VESDA-E Remote Accessories

When integrating VESDA-E Remote Accessories (such as remote displays, programmers, or relay modules) into an existing subrack or enclosure, it is important to understand how their mechanical installation can influence the ground fault behaviour on VESDA-E detectors.

Unlike some legacy VESDA accessories, VESDA E remote devices are designed with isolated grounding architecture. However, once mounted into a metal subrack or enclosure, the accessory's mounting hardware can unintentionally bond the device to the enclosure's chassis ground. This can create a ground reference on the VESDAnet wiring, potentially triggering a ground fault indication on the VESDA-E detector.

To avoid unintended grounding when installing VESDA-E Remote Accessories, please follow the below instructions:

- Do not fit the ground jumper on the accessory when VESDAnet ground fault monitoring is required.
- Use nylon or non conductive washers on mounting points to prevent metal to metal contact between the accessory and the rack or enclosure.
- Ensure the subrack or enclosure does not create an additional earth path, especially if the enclosure itself is bonded to building ground.
- Confirm that cable shielding and earth conductors are terminated in accordance with the VESDA-E installation manual, with grounding applied at a single designated point only.

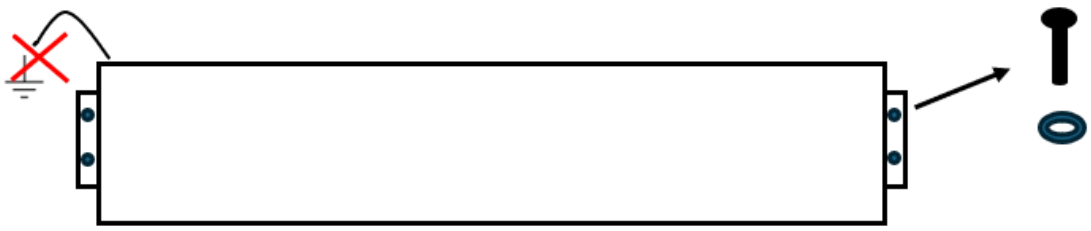

Figure 3: Grounding of VESDA-E remote accessory

Best Practices for Mixed VESDA-E and VESDA-L Series Networks

Recommended:

- Maintain consistent grounding practices across all devices.
- Ensure cable shields are grounded at one point only (typically at the panel).
- Use non conductive mounting hardware when isolation is required.
- Verify conduit systems do not inadvertently bond equipment to earth.
- Test VESDAnet wiring for leakage before commissioning.

Avoid:

- Bonding grounded and isolated devices on the same VESDAnet segment without proper assessment.
- Running VESDAnet cabling in wet or high condensation areas without protection.
- Allowing multiple earth references on communication circuits.