Railway monitoring

Distributed acoustic and temperature sensing

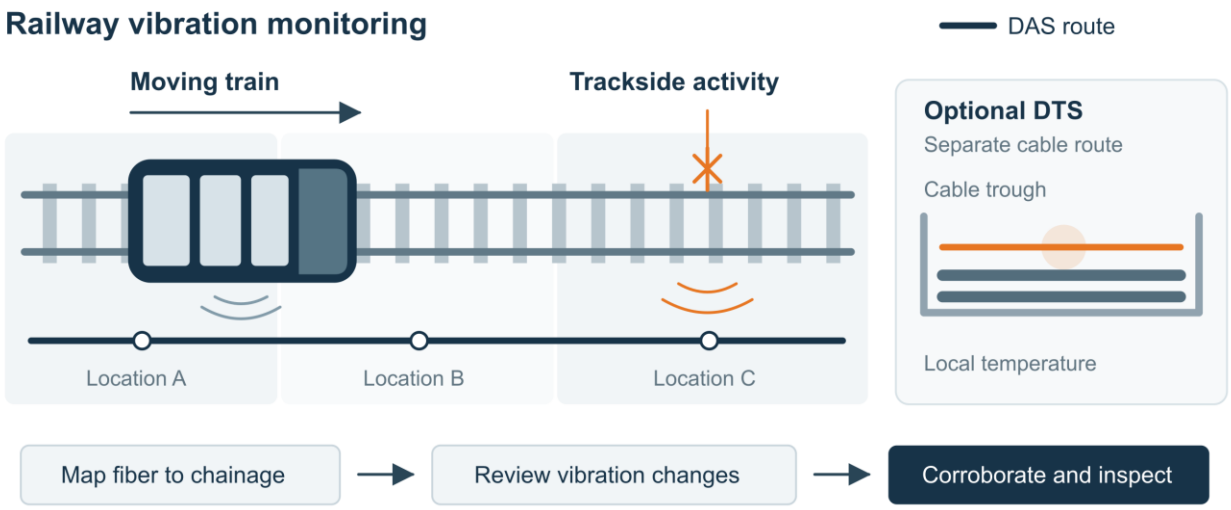
Planck distributed acoustic sensing (DAS) measures vibration along an optical fiber. A track-parallel sensing route provides observations that can be mapped to railway chainage for operational review and maintenance.

Train and trackside activity

Passing trains and nearby work create vibration patterns along the route. With suitable fiber coupling and validated processing, these observations can support train movement awareness and locate trackside activity for investigation.

Vibration records for inspection

Comparing repeatable patterns between train passages can help identify changes for engineering review. Train type, speed, adjacent tracks and ground conditions affect the comparison. Detailed wheel or rail defect diagnosis needs separate validation.



DAS observes vibration along the corridor; DTS measures selected thermal assets. Illustrative layout; not to scale.

System design

Route assessment

Assess fiber availability, optical loss and coupling before selecting equipment. Map fiber distance to chainage and asset records. A pilot establishes normal activity and tests representative events, including adjacent-track traffic and maintenance work. Some locations may need a dedicated sensing cable.

Cable and tunnel temperature

DTS provides a separate temperature profile along traction-power cables, cable troughs and tunnel services. It helps locate unusual heating where sensing cable placement provides suitable thermal contact. Conductor temperature or cable loading estimates require an appropriate thermal model.

Planck DAS equipment

Planck DAS systems use single-mode fiber with FC/APC connectors. REST API, WebSocket and Ethernet support project-specific data integration. DTS equipment is selected separately for thermal monitoring.

DAS system	Max. range	Spatial resolution
20 km single-mode	20 km	1–10 m
40 km single-mode	40 km	5–10 m

Select range and spatial resolution together with measurement settings. Confirm the configuration and performance in the model datasheet.

Agree event definitions, review procedures and acceptance tests before scaling. This is supplementary monitoring; it does not replace railway signaling, protection or safety inspection.

Discuss your project

Send the route length, fiber details and inspection priorities to discuss a railway pilot.

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