

The Siemens logo is displayed in a bold, teal, sans-serif font.

*Ingenuity for life*

The MRX Technologies logo features the letters 'MRX' in a large, bold, blue font, with 'TECHNOLOGIES' in a smaller, blue font below it. Underneath, it says 'A Siemens Business' in a very small font.

## Broken Rail Detection

Accurate and reliable prevention of service interruptions and derailments

**A rail network is only as reliable, safe and profitable as the track it runs on. This is why operators must invest time and effort on the monitoring and maintenance of rails to detect and repair breaks.**

**Constant monitoring is required to identify broken rails which, if left undetected, can lead to service interruptions and derailments.**

**Up until now, track circuits are a widely-used solution, but this has several problems: Track circuits cannot provide an accurate location of a break and they require a fixed block signaling system. Moreover, they do not monitor through switches and are only able to detect completely separated breaks.**

**To solve all of these problems in one simple unit, MRX has developed on-board Broken Rail Detection (BRD).**

This train-mounted solution validates the health of the rail, identifies any breaks, and accordingly notifies the rail status for the following train. BRD thus increases throughput as tracks can be maintained quickly and cleared for operation instead of being blocked for days due to a derailment.

BRD is designed for easy installation and operation on various rail-based vehicles. The sensor identifies breaks before a conventional track circuit could detect an electrical disconnect in the rail.

Any break in the rail can be identified with a very accurate GPS position within 100 mm (~3.9 in) for ease of identification and repair. On-board BRD reports to the back-office system to verify any detection. Messages are then passed to the signaling system or train control to take immediate action on the next trains passing the located breaks. This way, BRD offers a near real-time detection and verification of breaks in rails – for safer and more profitable operation.

### Our service – your benefits

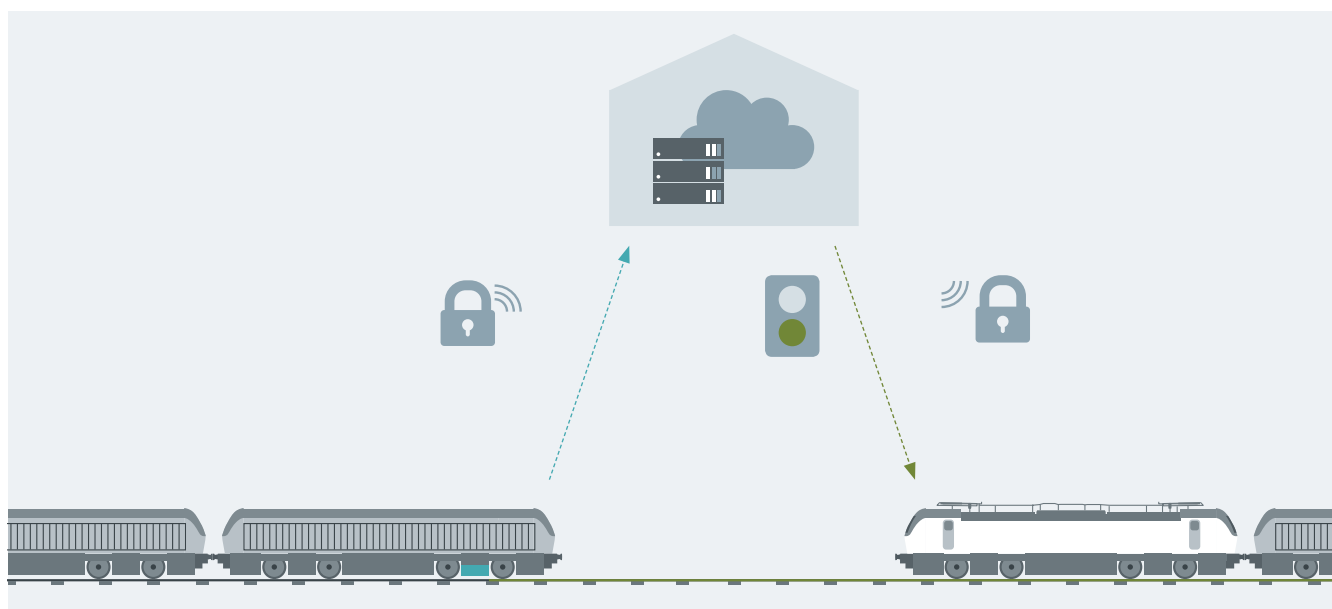
- Reliable detection of broken rails prevents service interruption and derailment
- Fast alerts give timely warning to following trains
- Extended inspection intervals reduce costs
- No wayside monitoring infrastructure necessary

# Keeping track of your rail status

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## All-in-one solution

BRD closely monitors your rail network during operation. Every train is equipped with a pair of sensors on one of the bogies – while the train is moving, these sensors scan the tracks. An on-board unit sends the collected data to the control center. Within seconds of a broken rail being detected, an alert is sent to following trains, or the interlock gets the information to block the respective line. All data is transmitted via a secure VPN connection. The output can be integrated into existing signaling and maintenance solutions.



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## Full-service offering

To allow you to focus entirely on your core business, we offer BRD as a comprehensive service: We install the product on-site, integrate the system in your train management and signaling systems and offer all the support you need.

Alternatively, we provide a basic solution without integration into your system. In this case, alerts will be sent to you via e-mail or text message.

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## A word about reliability

You can count on BRD; it is a highly reliable system. Testing and operation over more than 400,000 km (250,000 mi) has confirmed its value by identifying all broken rails, including breaks in switches and turnouts not covered by conventional track circuits. At the same time, false positives are remarkably low, more than 200,000 km (~124,274 mi) surveyed per false detection.

BRD supports self-calibration and verification. Your needs and preferences determine the scope of support: operator, installation and maintenance training can be provided, along with ongoing on-site and remote service.

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## Proven by field experience

BRD has already proven itself under the toughest conditions. One example: A freight customer looked for a way to increase the throughput of their heavy haul transport. Because their signaling solution could not cope with shorter headways, track circuits were removed and replaced by modern signaling technology. BRD took over the task of detecting broken rails. Since MRX has provided full-service coverage, current track status reports are being sent automatically for corrective actions to be taken. This way, the customer has been able to reduce downtime by 2%. He will roll out moving block signaling, confident that rail health is being continually monitored.



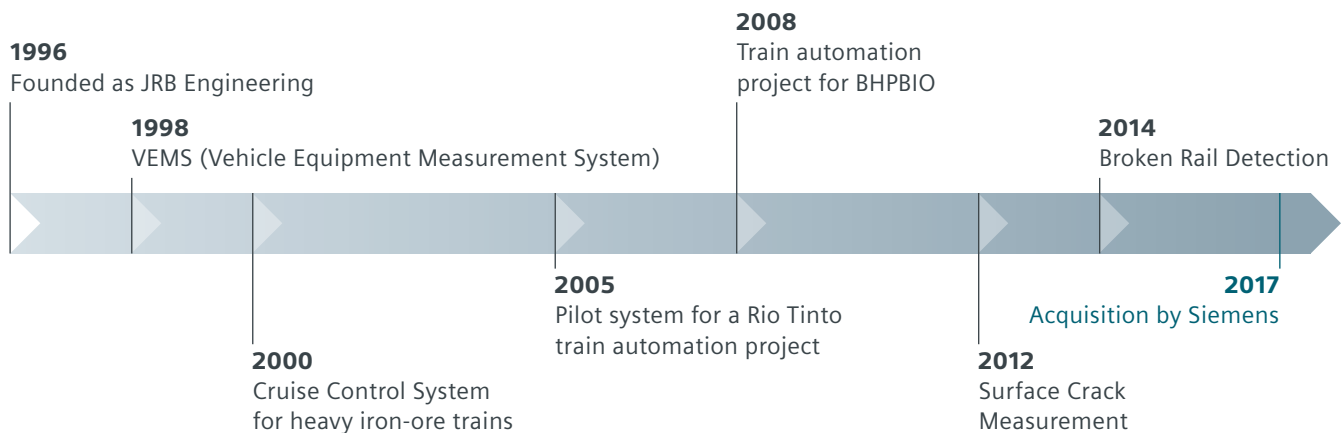
*„We have been aware for some time that there is a generational shift in rail signaling, especially for freight, to moving blocks. We were also aware that this left a gap for broken rail detection – a gap that our new BRD technology fills neatly in terms of cost, reliability and performance.“*

**Jim Blair,**  
Head of Project Delivery & Global Accounts  
MRX Technologies – A Siemens Business

# About MRX

MRX Technologies is an engineering organization, primarily active in the railway sector. With its highly motivated team of engineers and experienced specialists, MRX has offered services for manufacturers and operators of rail systems since 1996. The company's comprehensive portfolio includes measuring systems for digitalized condition monitoring of rolling stock and rail infrastructures, and inspection systems for rail networks. Drawing on years of expertise, MRX provides new sources of measurement data that can be evaluated to benefit rail operators – helping them optimize maintenance, increase availability and reduce costs.

## At the leading edge for over 20 years



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