



# SAUDI RAILWAY COMPANY

High Speed Tracking  
Case Study



# SAUDI RAILWAY COMPANY

---

Pursuant to the King Abdullah Bin Abdullaziz approval number (M/26) dated 25 / 4 / 1427H the public investment fund established the Saudi Railway Company (SAR) to manage the railway project from north to south of Kingdom of Saudi Arabia. SAR, as a new name in the domestic transport market seeks to satisfy market requirement by providing the best advanced railway services encompassing transport of passengers, freight, minerals and transit services between the neighbouring countries.

The railway will link a number of cities, neighbouring areas and villages which will lead to their development socially, economically, industrially, agriculturally and commercially.

In the future this will help also to establish advanced industries in the north of the Kingdom of Saudi Arabia.



## CASE BACKGROUND

---

Under Royal Decree No. 56 of 04/ 13/ 1424H the Kingdom of Saudi Arabia through the Ministry of Finance, Public Investment Fund (PIF), is financing the construction of a new Saudi Railway (SAR Project) in the Kingdom.

The SAR project, formerly known as the North-South Railway (NSR), is the largest railway construction project in the world today. The SAR Project consists of two main lines, one originating in Riyadh running approximately northwest to Al Haditha near the Jordan border, and a second main line running from approximately the mid-point of Riyadh. Both lines have a length of about 2400km.

## THE BENEFITS

---

The implementation of a passive UHF RFID solution provides to the Saudi Arabian Railway Company:

- Clear vehicle identification
- Allocation of sensor data to individual vehicles.
- Identification even at speeds up to 250 km/h
- Low maintenance and full operations

## THE SOLUTION

---

- Installation of 65 checkpoints along the track
- Reliable checking for all kinds of trains on load, trailers, axels and breaks
- Adaption of the solution to the challenging climate conditions of the Saudi Arabian dessert.
- High speed identification due to special software firmware and algorithms.

## THE CHALLENGE

---

Trains, carrying tons of minerals, never stop. They are loaded and unloaded, weighted, secured and checked during moving. Safety is very important, because these trains are driving very fast. Safety is also very important for passenger trains with a high speed up to 250km/h.

Each train consists of several hundred axles and it is difficult to find the corresponding trailer, if the break temperature of e.g. axles 257 might be of range.

This project specified a system requirement, which maps axle numbers to trailers at a speed of 250km/h. That's why RFID technology was selected because video is very complex for such high speed.

- The solution must be compliant to international standards and regulations of the railway company;
- Identification of train and trailer at high speed;
- Adaption of a passive UHF RFID solution to the harsh climatic conditions;
- Implementation of a reliable system which requires low maintenance due to an installation directly on the track.

# THE PROJECT

In order to guarantee the highest possible reading rate, both each trailer and each locomotive is equipped with two passive UHF C1G2 transponders, one tag each side, which are read when the train passes the checkpoint system.

Any error or system message can so be assigned to the unique trailer number, which could later easily be found by the maintenance staff.

## The Checkpoint System

Every checkpoint system consists of two fixed RFID readers with special 7iD firmware for high speed trailer tracking and a 7iD RFID Data Center with special high speed data filtering software.

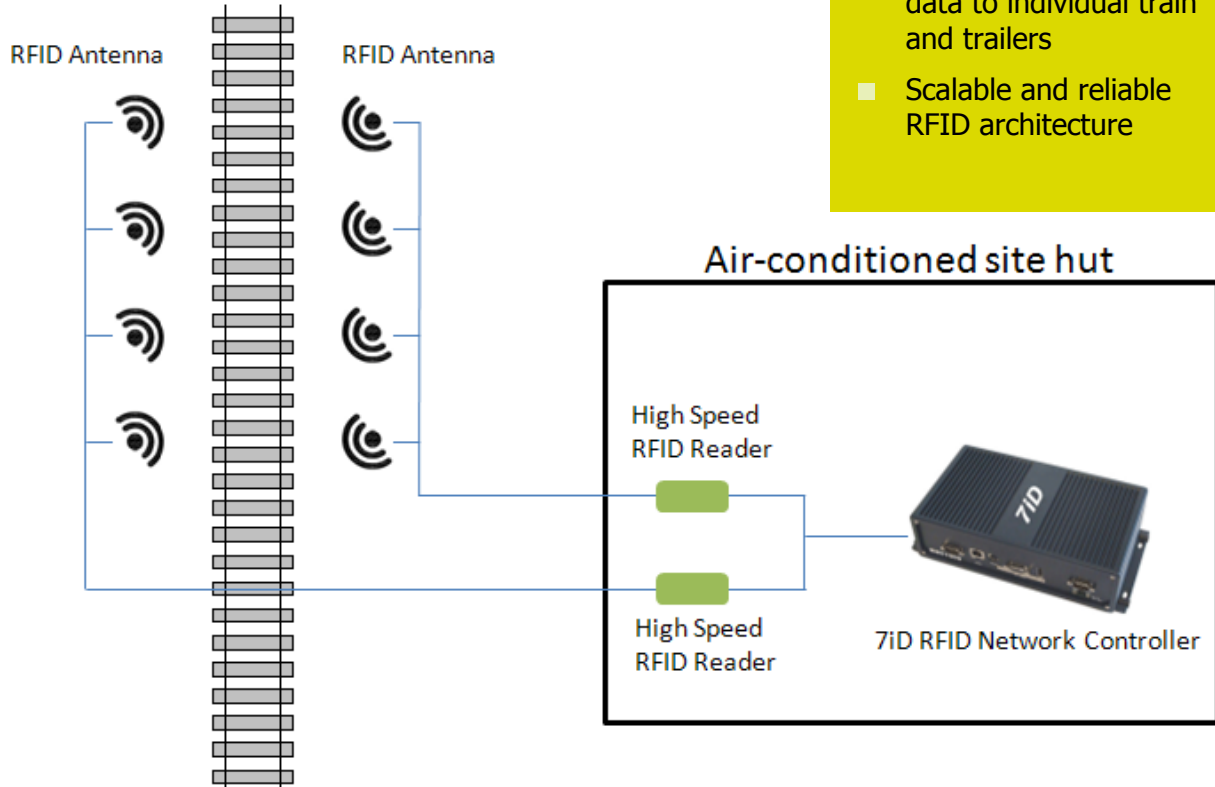
Sensor data from temperature and weight sensors are combined with the RFID data thus providing complete train lists with trailer numbers for safety checking.

The solution is especially build for the hot and dry climate of the Saudi Arabian dessert with temperatures up to 50° Celsius and winds with 200km/h.



### KEY FEATURES

- tailored for the climatic conditions
- 100 per cent identification at speeds up to 250 km /h
- Allocation of sensor data to individual train and trailers
- Scalable and reliable RFID architecture





**7iD TECHNOLOGIES GMBH**

Keplerstraße 105, 8020 Graz, AUSTRIA

Phone: +43 316 716 720

Fax: +43 316 716 720 399

[rfid@7iD.com](mailto:rfid@7iD.com)

[www.7iD.com](http://www.7iD.com)