**European Train Control System (ETCS)** is the core signalling and train control component of ERTMS, the European Rail Traffic Management System for mainline networks.

**Thales** participated in the creation and led the way with the very first implementations of this European standard. Created to enable interoperable operations throughout Europe, the standard also increases operational efficiency and safety for mainline traffic.

**The ETCS On-Board System safely monitors train movements**, and calculates the maximum speed limit and corresponding braking curves. Driver assistance is provided with cab signalling and, if necessary, takes control in the event of the permitted speed limit being exceeded.

40% potential capacity gains derived from ETCS implementation

Circa 10,000 ETCS-equipped trains contracted or in service

A global technology, with 50% of ETCS systems deployed or being deployed outside Europe

More than 67,000 kilometers of ETCS-equipped track contracted or in service
The largest high-speed network in Europe

Denmark

To ensure punctuality, increase capacity and decrease operating costs, Denmark launched the largest re-signalling project worldwide by modernizing the complete network within the scope of a single project, with Thales to look after the largest part.

Thales manages the turnkey project with Strukton Rail to deploy the ETCS L2 solution, interlockings, rail field elements throughout 1,300 km of track and 140 train stations.

Luxembourg

With 70% of Luxembourg’s mainline rail traffic crossing national borders, the interoperability provided by ETCS was essential. After certification, 90% of the national network got equipped with ETCS L1 in 2011, which represents around 250 km of line.

The Thales AlTrac ETCS solution was chosen by CFL to not only ensure operational interoperability but also to increase the safety level throughout the network.

Germany

The worlds longest ETCS line

A new 2,400 km line is being constructed to run freight and passenger trains across the desert through some extreme environmental conditions.

Thales is leading the consortium, with a local partner, to manage the turnkey project. As part of this project, Thales is deploying an integrated solution with ETCS L2, interlockings, rail field elements, an operation control centre, communications, solutions for passengers information and security, as well as infrastructure surveillance and law collection.

Austria

To reduce passengers travel time, and increase train frequency and capacity, Thales installed and integrated ETCS L2 Radio Block Centers on the new high-speed line and the existing conventional railways in Austria over 230 km double track.

Journey time from Vienna to St. Pölten was reduced by 13 min, and from Vienna to Salzburg by 23 min, by driving 230 km/h. There are 30% more trains each day with a maximum track speed of 250 km/h, whilst maintaining a high level of safety and reliability.

Thales manages the turnkey project with Strukton rail to deploy the ETCS L2 solution on 70% of the mainline rail traffic and 1,200 km of track.

ETCS for high speed lines

Spain

Thales worked on the network study and design, and then supplied and integrated the required rail control solutions across 70% of the Spanish high speed network. Rail control solutions include ETCS L1 and L2, as well as GSM-R communications and interlockings.

The ETCS technology increases the maximum permissible speed up to 350 kph, and reduces headways, thereby enhancing the network capacity. At the same time, service is improved and lifecycle costs are reduced.

Thales maintains live of the high speed lines, covering 1,300 km of track.

ETCS L1 for intercity lines

Turkey

Thales installed the AlTrac ETCS L1 solution, interlockings, and Traffic Control Center on the first high-speed line of Turkey, on 262 km from Ankara to Edirne. ETCS L2 deployment and test are ongoing in that section. The second phase of the project includes a 173 km line section currently under test and commissioning. When complete, Travel time from Ankara to Istanbul will be reduced from 7 hours to 2.5 hours. Additionally, the 33km commuter line from Cumhuriyet to Topkapı is being equipped with ETCS L1 & L2 solutions.

Gyeongchun & Jeolla lines, South Korea

ETCS L1 in South Korea enabled train speeds to be increased to 200 km/h whilst reducing headways to 4 minutes.

The implementation was achieved in less than 8 months, in time for the World Expo 2012.

The worlds longest ETCS line

The worlds longest ETCS line

The worlds longest ETCS line

The worlds longest ETCS line

ETCS for high capacity commuter connections

Madrid, Spain

Increasing the passenger volumes in Madrid. Thales deployed ETCS solutions on 80 km that included the three most popular commuter lines, the existing Atocha main station, the newly constructed Sol station, as well as the new tunnel.

This was the first installation of ETCS on commuter lines.

Speed was increased, as well as capacity, whilst costs efficiency is maintained and safety is assured.

Thales designed and built the supervision and the signalling system, as well as the ETCS solutions deployed.

Madrid’s Atocha main station is now equipped with ETCS L1 & L2 solutions.

Additional, the 33km line section is being equipped with ETCS L1 & L2 solutions.

ETCS for high capacity commuter connections

Mexico suburban railway

To meet the needs of 280,000 passengers daily, Mexico needs a new suburban line, with a reliable, punctual and frequent service.

Thales designed and built the supervision and the signalling system, including the train control systems (ETCS L1), and now maintains the Cuautitlan-Buenavista corridor.

ETCS for high capacity commuter connections

Poland

In 2013, Poland’s railways, one of the most dense rail networks in Europe, obtained ETCS certified ETCS L1 for intercity lines. Subsequently, Thales was awarded several contracts to install the AlTrac ETCS L1 and ETCS L2, as well as GSM-R solutions.

To reduce passengers travel time, and increase train frequency and capacity, Thales installed and integrated ETCS L2 Radio Block Centers on the new high-speed line and the existing conventional railways in Poland over 300 km double track.

Increasing the frequency of trains was the fundamental answer to addressing the increasing passenger volumes in Madrid.

In addition to validation and integration tests for the ETCS system, Thales deployed interlocking systems and rail field elements that allow trains speed up to 250 km/h.

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ETCS for high speed lines

References focus

National rail network modernisation with ETCS

The largest high-speed network in Europe

Spain

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ETCS for high speed lines

The worlds longest ETCS line

Kingdom of Saudi Arabia

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Thales is leading the consortium, with a local partner, to manage the turnkey project. As part of this project, Thales is deploying an integrated solution with ETCS L2, interlockings, rail field elements, an operation control centre, communications, solutions for passengers information and security, as well as infrastructure surveillance and law collection.

ETCS for high speed lines

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ETCS for high speed lines

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ETCS for high speed lines
Thales, a worldwide leading supplier of ETCS

**ALTRAC ETCS REFERENCES** (contracted or in service)

**Algeria**
- ETCS L1 & 2 for the Rocade Nord Railway

**Austria**
- ETCS L1 from Vienna to Nickelsdorf & from Attnang to Salzburg & from Wels to Passau
- ETCS L2 from Vienna to St. Pölten & Unterinntal (Corridor from Germany to Italy)

**Bulgaria**
- ETCS L1 from Sofia to Burgas, track side and On-Board Unit
- ETCS L1 from Plovdiv to Svilengrad
- ETCS L1 from Septemvri to Plovdiv

**Czech Republic**
- On-Board Unit

**Denmark**
- ETCS L2 on 60% of the Danish mainlines

**Finland**
- ETCS L1 for the HSL from Kerava to Lahti

**Germany**
- ETCS L1 & 2 though Nuremberg, Ingolstadt and Munich
- On board Unit

**Greece**
- ETCS L1 from Athens to Thessaloniki and the Bulgarian border

**Hungary**
- ETCS L1 from Kelenföld to the Hungarian border (approx. 180km)
- ETCS L2 from Buda to Bajánsenye
- ETCS L2 from Szajol to Püspöklándány
- ETCS L2 from Gyoma to Békéscsaba
- ETCS L2 from Ferencváros to Monor

**Luxembourg**
- ETCS L1 on 90% of its network

**Malaysia**
- ETCS L1 for Kuala Lumpur monorail

**Mexico**
- ETCS L1 for the Cuautitlán - Buenavista suburban line

**Morocco**
- ETCS L1 from Casablanca to Rabat

**Netherlands**
- ETCS L1 & 2 for the HSL Zuid

**Poland**
- ETCS L1 from Grodzisk Mazowiecki to Zawiercie
- ETCS L2 for E20 and E65 lines

**Romania**
- ETCS L1 from Fetesti to Constanta
- ETCS L2 from Buftea to Brazi

**Saudia Arabia**
- ETCS L2 for the North-South Rail (NSR) Link

**Slovakia**
- On-Board Unit

**Slovenia**
- ETCS L1 on Corridor V

**South Korea**
- ETCS L1 for the Gyeonchun Line
- ETCS L1 for the Jeolla line

**Spain**
- ERTMS deployed on 30% of the HSL global network
- ETCS L1 & 2 for Madrid commuter network

**Switzerland**
- ETCS L2 through the Lötschberg Tunnel
- ETCS L2 through the Gotthard Tunnel

**Turkey**
- ETCS L1 & 2 from Ankara to Eskisehir, part of the Ankara to Istanbul HSL
- ETCS L1 & L2 for the commuter line from Cumaovasi to Tepekoy