SATELLITE CONTROLLED TRAINS
Taking a cue from how ESA controls satellites, Spanish railways now have their own high-tech upgrade to keep travellers abreast of when the next train is going to arrive.

Drawing on sophisticated software that keeps satellites on track, the system was developed by a group of Elecnor Deimos engineers who had worked extensively on ESA projects. The outcome of this technology transfer is that up-to-date train schedules are now displayed at over 400 Spanish stations.

Said Carlos Fernández de la Peña, Director of Systems and Networks at Deimos, “This came about as a result of the team’s work with ESA’s largest satellite, Envisat.” For Envisat, they created a software system designed to cope with the vast complexity of planning the satellite’s operations. He added, “It had to be robust, reliable and work 24/7. There is no room for error when it comes to satellites. For instance, Envisat operators had to monitor 20,000 readings continuously to operate and control the satellite.”

Since its creation in 2001, Deimos Space, now part of Elecnor Deimos, has been spinning off the space technologies and techniques acquired by its involvement in space projects “What we have done is take the experience of working with large, distributed, reliable, computer-based satellite control systems and apply it to non-space fields.”

ESA’s Technology Transfer Programme technology broker for Spain, Tecnalia, collaborates closely with Elecnor Deimos, through ProEspacio, the Spanish Association for Space Technologies, to develop spin-off opportunities.

Tecnalia’s Richard Seddon explained, “We help in the search for clients for their often leading-edge and intelligent spin-offs from the technologies and expertise developed for space missions. Matching these spin-offs with identified needs in non-space industries, in this case, resulted in a successful contact with Adif, the company managing Spain’s railroad infrastructure and rail traffic. Adif were faced with serious problems tracking all the trains within their system, and we thought this is very much like the tracking requirements for satellites.”

To know where all the trains are at any time, the Deimos engineers drew on their space experience, noted Fernández de la Peña, “For Adif, we have created a computer system similar to the monitoring and control system of a satellite. The first thing we did was get railway traffic information in real time. From there, there were more questions to answer: Are the rails ready? Which trains are using the rails in which direction? Is there a delay? What are the
destination platforms? Is there any problem at a station a train is going to pass through? This looks easy, but it is not.”

ENVISAT

Train near Vinaixa, Spain

Satellite control