

10 Years of Innovation with China' s Intelligent Transport Systems How Infinova' s integrated approach influenced Expressway Construction

Today China is one of the leading countries in Intelligent Transport Systems (ITS) construction with over 60 thousand kilometers of state-of-the-art expressways and ranking second to the United States with the world' s longest National Trunk Highway System (NTHS). China has come a long way since the construction of its first expressway, the Hu Jai expressway (built in 1988), and has become one of the word leaders in ITS construction and design.

Jing-Jin-Tang - An ITS Expressway

One of the early applications of advanced technology in transport systems was the Jing-Jin-Tang expressway (Jing-Jin) that began construction in 1993 and was equipped with video surveillance, communication, lighting, tollgates and other high-tech facilities. As a result the Jing-Jin became the technical standard for ITS construction in China. Since then, as part of the initiative for the technical advancement expressways, China has applied the ITS theory to all new expressway construction.

At the time the Jing-Jin was constructed there were very few companies offering integrated solutions for video surveillance for transport in China. Infinova entered the Chinese market in 1994 and launched a range advanced products that became widely used in electrical and mechanical projects for Chinese expressway construction.

Matrix Switching Industry Standard

The Infinova matrix switching system provided the technology needed to build a fully integrated solution for the ITS expressways and Infinova' s matrix protocol became the industry standard used for ITS video surveillance systems. This set the standard that would become the model for the development of Chinese video surveillance systems used in transport. In addition to video surveillance for monitoring traffic on the expressways, the operation and administrative offices needed additional surveillance to secure the tollgates and report traffic status. Together this created a demand for remote video transmission devices to be part of the ITS solution.

Leading the industry - Stand-alone and Rack Mount

In 2000 introduced their new FM Fiber Optic Rack Mounted Modem, a 3 unit (3U) tall Fiber Optic (FO) modem offering the highest rack density among all available FO modems. A big advantage over stand-alone modems, was that the rack mounted solution reduced the space needed in central control rooms leading to lower operating costs and better utilization of space.

At the front-end however space is not an issue and a stand-alone modem is the better solution. Infinova led the industry by designing its FO modem so that is could be used in a rack mount or a stand-alone configuration. The product is the same and solution designers only need to specify a different housing.



Stand-alone Modem



Rack Mount Modem

An Integrated Solution

Soon after the year 2000, the ITS expressway projects started requiring multiple stations along an expressway to be integrated and managed form a single point of control. Once again, Infinova led the industry introducing the world' s first video matrix switching system that could be networked through Ethernet. This enabled operators to simultaneously program both features and menus on literally hundreds of remote units from a single central matrix switch in the master control room.



Ethernet Matrix Switching System



Universal Security Platform

Integrating Different Manufacturers

As the expressways extended through China's provinces, as you would expect multiple different construction companies and manufacturers became involved in completing projects in each province. Infinova took on the role of solution integrator and developed hardware protocol conversion technology to make the components from the different manufacturers work together as an integrated solution. The new Infinova products included multiple protocol system integrators, Ethernet matrix switchers and other products. The hardware protocol conversion technology gave the expressway a reliable and cost effective solution for integrating video surveillance, tollgates and communications from multiple different suppliers. As a result the Infinova solution was soon adopted across the whole province.

An Industry first - consolidating solution sub-systems on a single chassis

The next step in the integration was to consolidate the different solution sub-systems into a single chassis. Working with customers over several years in research and development, in 2008 Infinova released the N3100 Universal Security Platform (USP). The Universal Security Platform uses a "Blade" approach to integrate video transmission, control, management, data transmission, switching and storage into a single platform that can be managed as a single device requiring very low fiber optic resources.

