



Location: **Taiwan**

High-Speed Cellular Network for an Electronic Toll Collection System

Application:

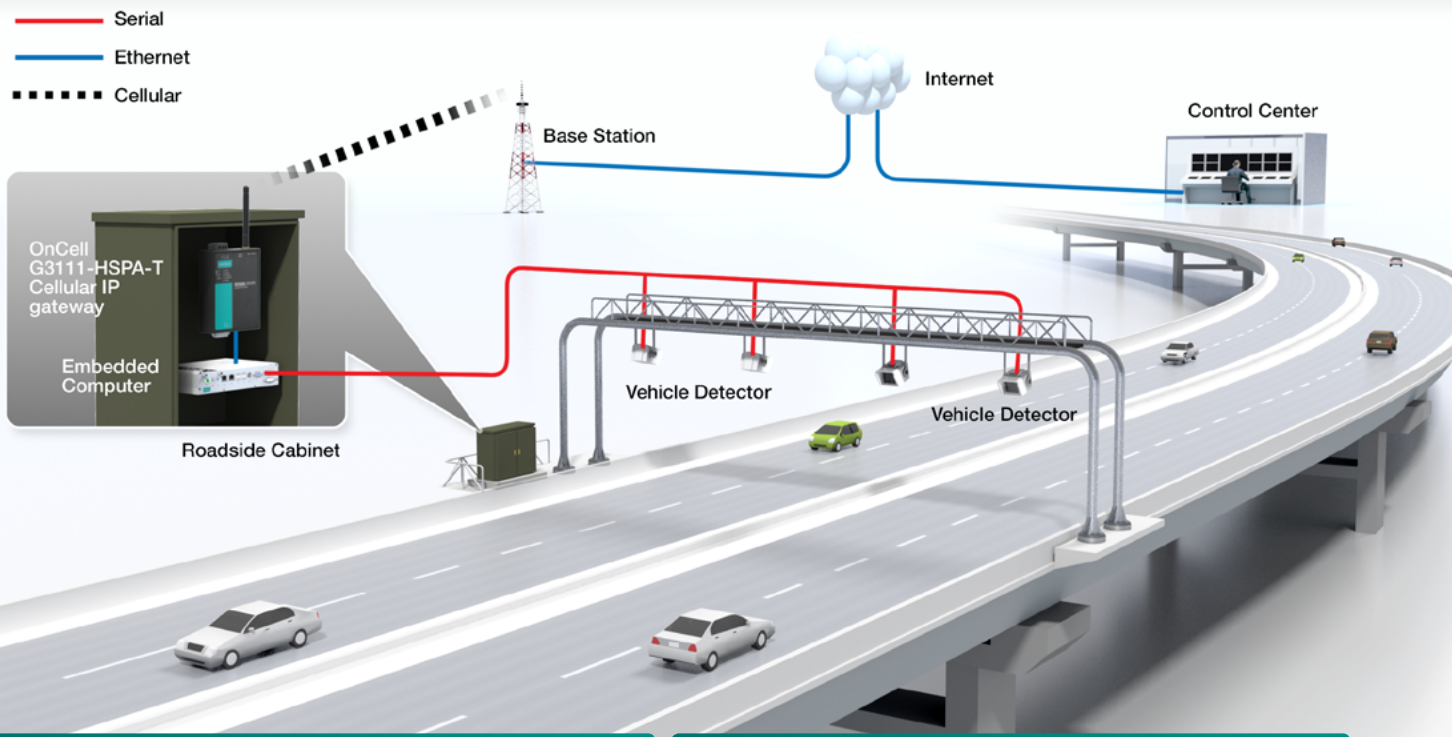
Electronic Toll Collection

Customer Needs

- Withstand the high temperatures generated by several pieces of electronic equipment operating inside a small cabinet
- UL-certified cellular products to meet safety requirements
- Compact dimensions for installation on a gantry

Moxa's Advantages

- -40 to 75°C operating temperature range to handle extreme temperatures inside the cabinet
- UL-certified to ensure device safety
- Palm-sized design to fit in applications with space constraints



Project Background

An Electronic Toll Collection (ETC) system allows drivers to pay tolls without stopping at toll booths, thus eliminating the delays frequently experienced on toll roads without an ETC system. When a vehicle enters the toll road, sensors installed on top of the gantry detect the transponder or GPS device installed in the vehicle, and then use the vehicle's ID to automatically debit the vehicle's account.

A road operator company in Taiwan implemented ETC systems on highways not only for toll collection, but also for vehicle detection. Once the data collected by an ETC system has been processed by the system's computers, the cellular network forms the communication link between the ETC system and the control center. The ETC equipment needs to be installed in small cabinets located along the highway and must be able to withstand the extreme temperatures generated by the electronic equipment installed inside the steel cabinets.

System Requirements

- A wide operating temperature range to ensure network reliability
- UL-certified cellular device to ensure smooth ETC system operation
- Compact design to fit inside a small roadside cabinet

Moxa's Solution

Traditional toll plazas are expensive due to the initial construction costs as well as the ongoing labor costs of staffing the booth. However, the biggest problem is that the toll plazas become traffic bottlenecks for many highway systems. So, instead of renovating old toll plazas, many governments have chosen to construct ETC gantries to improve traffic flow by making toll collection more efficient. The road operator company that helped the Taiwanese government implement ETC systems across different highways in Taiwan used Moxa's OnCell G3111-HSPA cellular IP gateway to transmit data from a vehicle's sensors back to the control center. With multiple vehicles entering the toll road at high speeds every second, network latency is unacceptable. Moxa's 3G cellular gateway ensures that sufficient bandwidth is available for data communications at every gantry.

The ETC equipment is installed in roadside cabinets located along different highways in Taiwan. Since the OnCell G3111-HSPA-T supports operating temperatures from -40 to 75°C it is able to withstand the 60°C that is frequently experienced inside the cabinets due to the combination of the tropical weather in Taiwan and the heat generated by several devices operating inside a compact steel cabinet. Even though several pieces of ETC equipment are housed inside each cabinet, our cellular gateway's palm-size compact design makes it the ideal product to be used for space limited applications.

Benefits

- Supports 3G technology to provide a high speed cellular network for data transmissions
- -40 to 75°C operating temperature range to ensure network reliability under harsh outdoor environments
- Palm-sized device able to fit in space restricted cabinets
- UL-certification ensures that the cellular device is suitable for ETC operations



© 2016 Moxa Inc. All rights reserved.
The MOXA logo is a registered trademark of Moxa Inc. All other logos appearing in this document are the intellectual property of the respective company, product, or organization associated with the logo.

Related Products



OnCell G3111-HSPA-T

Industrial five-band GSM/
GPRS/EDGE/UMTS/HSPA
cellular IP gateway

http://www.moxa.com/product/OnCell_G3111_G3151-HSPA.htm