



Location: **Taiwan**

# Deploying High-Speed Cellular Networks for Feeder Terminal Unit (FTU) Automation

## Application:

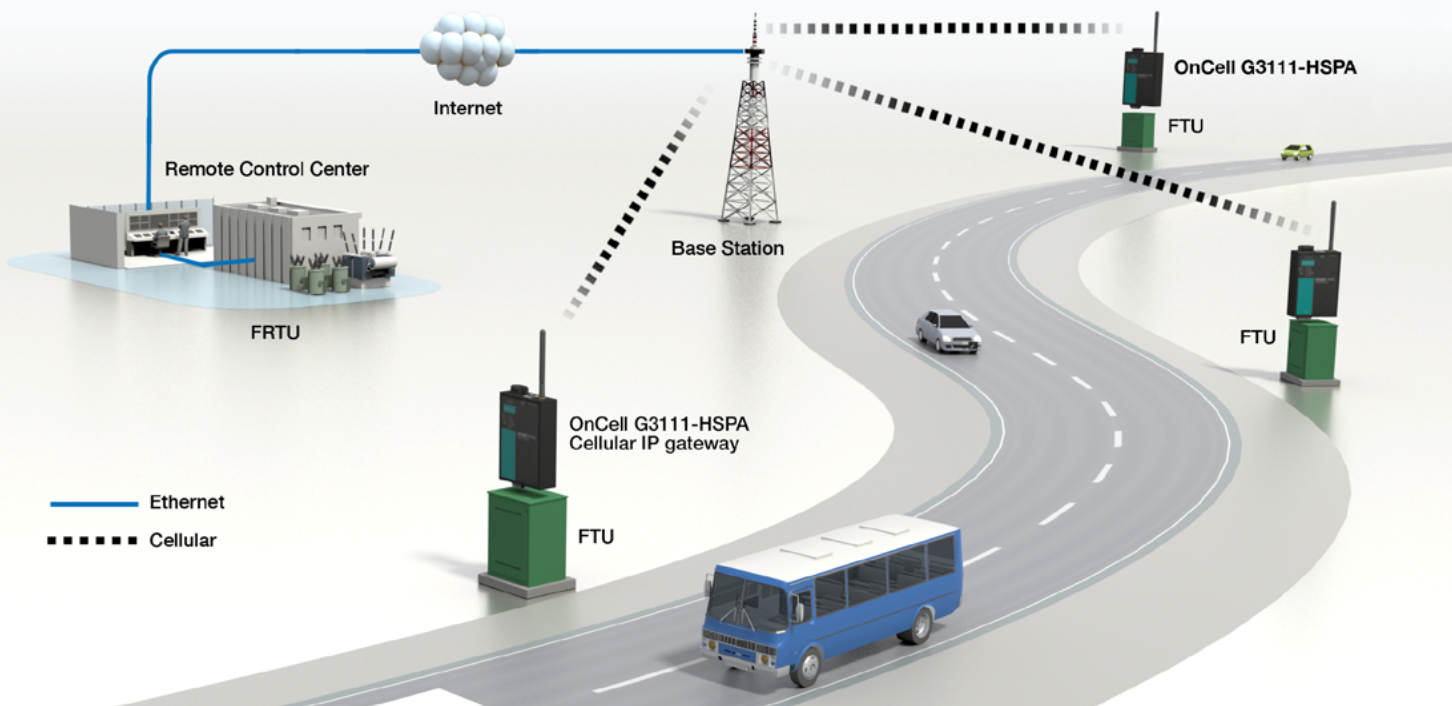
FTU Monitoring

## Customer Needs

- TCP/IP-based connections between the feeder remote terminal units (FRTUs) and the FTUs without the need to install additional software thereby reducing R&D and maintenance costs
- A reliable cellular network to ensure that the FRTUs receive notifications from the site when any of the FTUs in the network goes down
- Both serial and Ethernet ports to connect devices with different interfaces

## Moxa's Advantages

- A solution that can provide reliable TCP/IP-based connection between the FRTU and FTUs at a site without the need to install additional software
- GuarunLink technology ensures reliable cellular connectivity between the FTUs and the FRTUs
- Both serial and Ethernet ports for flexible deployment of sensing equipment at the FTUs



## Project Background

Since power plants are often located far from the population centers they serve, electricity needs to be transmitted across long distances at a high voltage. Power lines deliver electricity from the plant to the power substations, where it is converted to a lower voltage before being distributed to the local community. The feeder terminal units (FTUs) monitor I/O statuses by collecting and processing digital and analog data at each site. An electric power utility company in Taiwan divided its power grid into several districts. Each district consisted of several FTUs that are connected in a ring topology and monitored by an FRTU. A reliable IP-based cellular gateway is required at each FTU to ensure smooth cellular connectivity for sending notifications to the FRTU whenever one of the FTUs goes down.

## System Requirements

- An IP-based solution to enable reliable TCP/IP communication between the FRTUs and the FTUs
- Self-healing technology for prompt recovery of the monitoring network when an FTU goes down
- Both serial and Ethernet ports to accommodate devices with different interfaces

## Moxa's Solution

Each FTU is constantly transmitting parameters, such as the fluctuating levels of electricity, to the local FRTU of that district. The FRTU usually communicates with FTUs through fiber connections. However, when an FTU is used at a hard-to-access location, it's too difficult or expensive to implement a wired connection. By taking advantage of the OnCell G3111-HSPA's ability to connect a serial device or an Ethernet device deployed in each FTU, Moxa also enabled the utility company to monitor all the districts in the power grid from a remote control center without the inconvenience and expense of constructing a new wired network.

As an additional safety mechanism, administrators are given the option of issuing commands to the FRTU to shut down a faulty FTU, effectively isolating the problem in order to protect the rest of the power grid. Since electricity is an important and essential service for the district, the communication link between the FTUs and FRTU must be reliable. In order to provide a fully functional self-healing network with immediate recovery function, the OnCell G3111-HSPA also comes equipped with GuaranLink technology, which ensures that the connection is always on to provide zero data loss and on-demand cellular communications.

## Benefits

- The IP-based cellular network fully automated the monitoring system without the need to reconfigure TCP/IP settings
- GuaranLink technology provided uninterrupted cellular communication so that the FRTU can immediately isolate an FTU (when it fails) thereby improving the reliability of the power transmission network, shortening the outage time, and considerably reducing the scope of the damage
- Both serial and Ethernet ports were available for easy deployment of devices at each FTU



© 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

Five-band GSM/GPRS/  
EDGE/UMTS/HSPA IP  
gateway for serial-over-  
cellular (RS-232) or  
Ethernet-over-cellular (RJ45)

[http://www.moxa.com/product/OnCell\\_G3111\\_G3151-HSPA.htm](http://www.moxa.com/product/OnCell_G3111_G3151-HSPA.htm)