Solution
- Electronic Toll Collection (ETC)

▌At a Glance

Recently, manual highway toll collection system has been replaced by electronic or automatic one thanks to the rapid development of various technologies. Compared with the manual highway toll collection system, electronic highway toll collection system allows road users to keep driving without stopping when entering the toll lane. Therefore, the total travelling time can be shortened, and air pollution can be decreased. Moreover, the decrease of human intervention at the toll lane can also reduce human error and increase efficiency when collecting tolls.
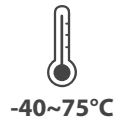
The deployment of electronic highway toll collection system uses various devices such as in-vehicle electronic tags, RFID readers, ETC toll display monitor and data (billing) center. All end-devices mounted on the toll gate or installed near the toll gate generally use wired (or wireless) connection to the switches that provide Ethernet connection and transmit data to the data (billing) center. To ensure the stability and quality of wired (or wireless) connection, the switches that provide Ethernet services must be able to withstand temperature change especially when placed outdoors and provide uninterrupted connection even when a single point of failure occurs so that vehicle data can be transmitted in real time to the data (billing) center at the remote site. Other challenges that need to be thoughtfully considered are listed below:
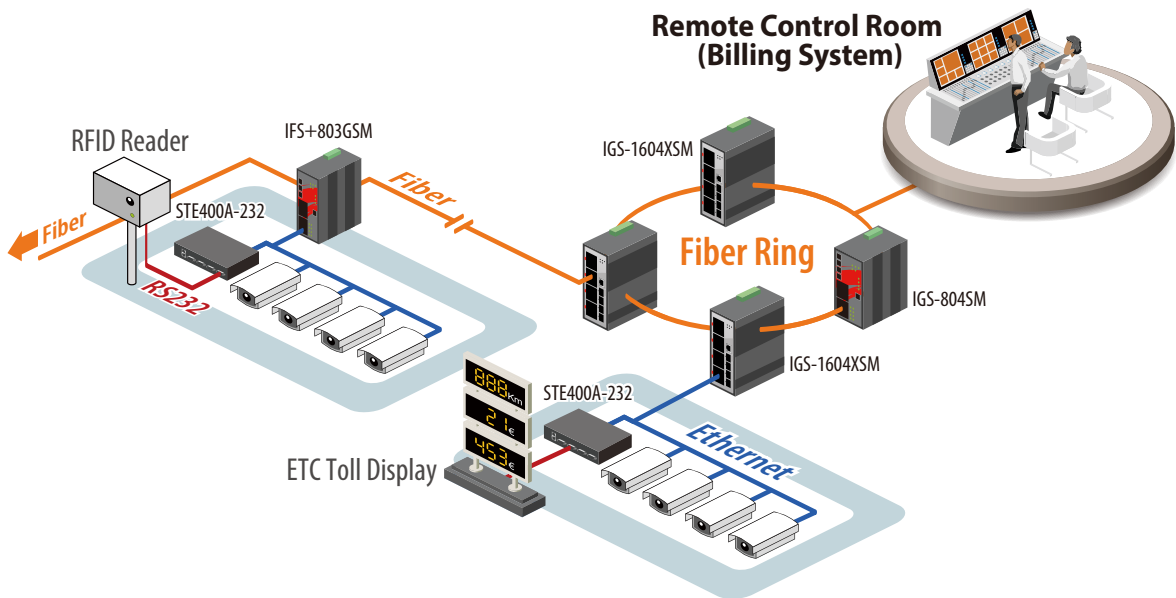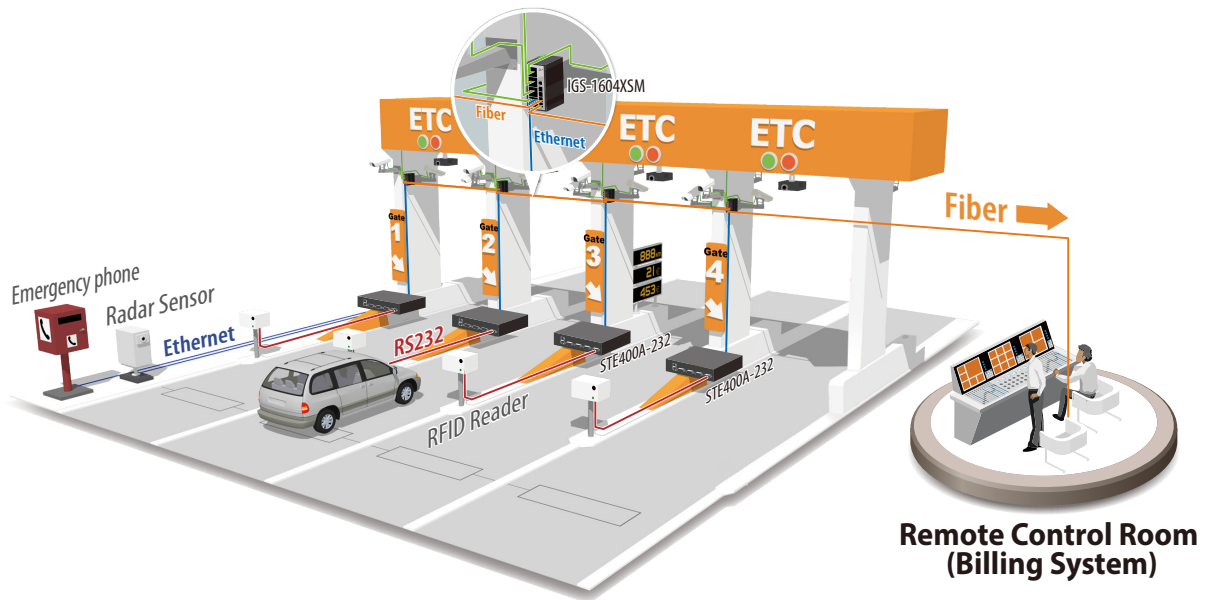
Challenges

· Devices placed outdoors are easily affected by various noises which can result in malfunctions of the billing system such as toll re-deduction.

· Switch devices placed around the toll gate may have high possibilities to be hit by lightning or suffer from ESD and surge.

· When a single point of failure occurs in a device, the engineer may not be able to visit the field site immediately to solve the problem.

· Outdoor temperature varies greatly from day to night or from season to season. During summertime, the temperature in a metal junction box may reach up to 60°C or higher; however, in winter, temperature may drop to -20°C or lower.

CTC Union's Solution

· Provides Industrial grade EMI and EMS certification to offer better protection against unexpected lightning strikes, ESD or surges.

· Supports various efficient network redundancy (such as u-Ring) when a single point of failure occurs. u-Ring can support up to 5 rings (max.) and can recover from a single point of failure in 10ms.

· Supports wide range of operating temperature (-40~75°C) with rugged design.

EN62368-1   **EN50121-4**   **EN61000-2 EN61000-4**   **u-Ring**   **-40~75°C**

Application

IGS-1604XSM
Fiber
Ethernet

ETC ETC ETC

Gate 1 Gate 2 Gate 3 Gate 4

888
21
453

Fiber →

Emergency phone
Radar Sensor

Ethernet

RS232

RFID Reader

STE400A-232

STE400A-232

**Remote Control Room
(Billing System)**

**Remote Control Room
(Billing System)**

RFID Reader

IFS+803GSM

Fiber

IGS-1604XSM

Fiber

STE400A-232

RS232

Fiber Ring

IGS-804SM

IGS-1604XSM

888 Km
21 €
453 €

STE400A-232

ETC Toll Display

Ethernet

Related Products

Industrial GbE Managed Switches
IGS-1604XSM & IGS-804SM & IGS+404SM

Industrial FE Managed Switches
IFS+803GSM & IFS+402GSM

Serial Device Servers
STE400A-232 & STE800A-232

· The specification and pictures are subject to change without notice.

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