



In many countries, people rely heavily on trains or high-speed trains to travel between cities or countries. Owing to high usage rate of train system, some countries are updating train infrastructure to electrification system so as to deliver efficient, faster and environmentally-friendly rail services to passengers. Besides, the network system is also updated from non-IP based to IP-based allowing greater integration and operation flexibility.

However, in electrified train system, requirements of switch devices deployed along trackside are different from requirements of switch devices used in old train infrastructure. To name a few, switch devices should be able to avoid impacts or damages caused by electromagnetic disturbances and interference. Moreover, switch devices should be able to withstand vibrations caused by passing trains and able to provide stable and uninterrupted services even under extreme weather conditions. To establish modern and safe rail system, there are several technical challenges that need to be considered.

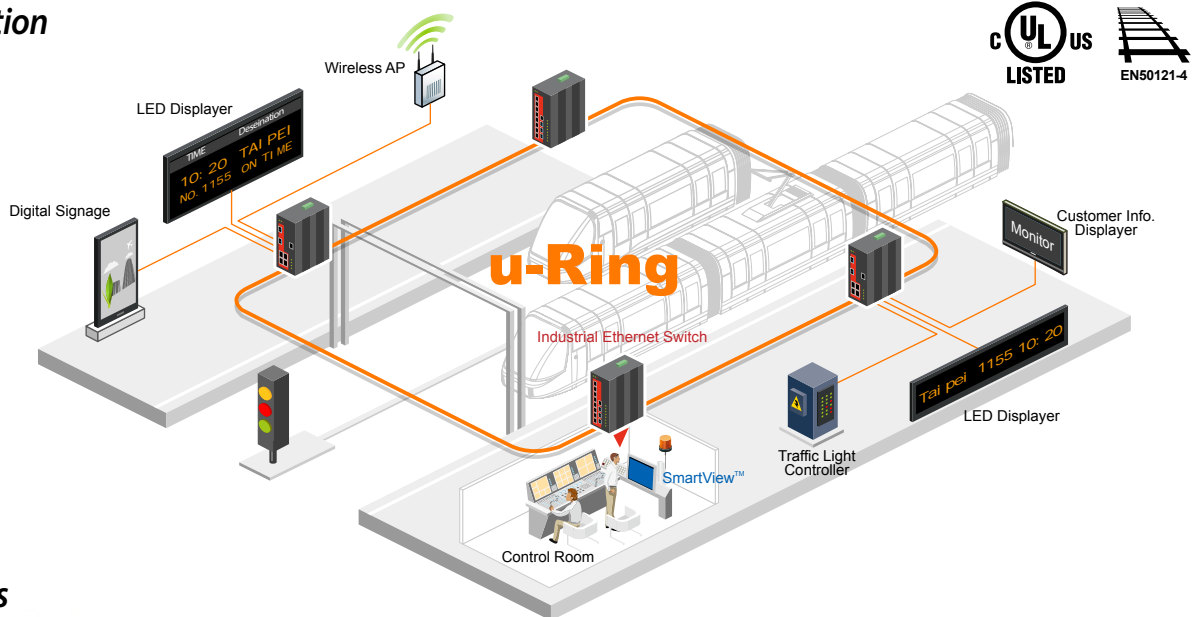
## Challenges

- Devices placed along trackside may have high possibilities to be hit by lightning or suffer from ESD and surge.
- Non-robust devices become mal-functional because of shocks or vibrations caused by passing high-speed trains.
- 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

- Provide Industrial grade EMI and EMS certification to offer better protection against unexpected lightning strikes, ESD or surges.
- Pass the EN 50121-4 certification for trackside use.
- Support various efficient network redundancy (such as u-Ring) when a single point of failure occurs. u-Ring can support up to 5 rings (maximum) and can recover from a single point of failure in 10 ms.
- Support wide range of operating temperature (-40~70°C) with rugged design.

## Application



## Products



**Industrial GbE Managed Switch**  
IGS-1604SM & IGS-812SM & IGS-803SM & IGS-404SM



**Industrial FE Managed Switch**  
IFS-1604GSM & IFS-803GSM & IFS-402GSM

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