

# Case Study: Taking EV Charging Global with a Universal RFID Solution

Contributed by ELATEC

Radio-frequency identification (RFID) enables fast, easy user authentication and access control for EV charging. But, with more than 60 RFID transponder technologies in use globally — along with smartphone-based credentialing systems based on Bluetooth® Low Energy (BLE) or Near-Field Communication (NFC) — it can be challenging for OEMs to serve all markets. AUTEL, a leading provider of DC and AC charging station infrastructure, maximized their market opportunities and simplified inventory management with a universal RFID reader.



## RFID for EV Charging: How It Works

The RFID reader allows users to identify themselves at the charging station and gain access to charging services.

- The reader is embedded into the charging infrastructure.
- Users are issued ID cards with an embedded RFID antenna and an integrated circuit that stores a unique data set (e.g., a number) for user identification. Alternatively, they may use a smartphone app that acts as a card emulator.
- When the card or smartphone is held up to the reader, the reader transmits

a radio signal to interrogate the tag or app, prompting it to send the unique identifier to the reader.

- The reader connects to backend software to control access levels, connect users to their accounts for payment information or loyalty programs, and track user behavior.

## Many Markets, Many Technologies

There are more than 60 RFID transponder technologies in use globally, which are broadly categorized as high-frequency (HF) or low-frequency (LF).

- HF RFID operates in the range of 3 to 300 MHz, with 13.56 MHz being the standard. HF has a good read range ( $\leq 30$  cm) and excellent data transfer speeds and memory capacity, making it ideal for applications such as EV charging.
- LF RFID operates in the range of 30 to 300 kHz (125 kHz standard) with a read range of  $\leq 10$  cm. LF technologies are less likely to be used for EV charging but may still be encountered in some regions.

- Smartphone credentialing systems can use either BLE or NFC. NFC operates at the same frequency as HF RFID (13.56 MHz).

Within these broad categories, there are dozens of different technologies in use, including MIFARE, HID iCLASS, DESFire, and many others. Most RFID readers are able to read only a handful of these.

To reach all their markets, AUTEL had to stock several different versions of their product with readers from different manufacturers. This created significant challenges for inventory control and post-sales support. It also limited their ability to help customers with a diverse user base and prepare for future requirements.

## A Universal Reader for Global EV Charging

AUTEL found their answer in the TWN4 MultiTech reader from ELATEC. This universal RFID reader supports 60+ transponder technologies, covering all major RFID standards worldwide for frequency ranges 125 kHz and 134.2 kHz, as well as the 13.56 MHz band, including NFC for mobile (BLE upgrade available). It is also certified for use in 110+ countries worldwide.

The reader is easy to update via contactless config cards or centralized remote updates. This gives AUTEL — and their customers — the flexibility to add new technologies after installation and update software and firmware to respond to changing security requirements or add new functionality.

With a universal reader, AUTEL has simplified inventory management and after-sales support while maximizing their global market opportunities. ◀

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