ELATEC
RFID Systems

RFID APPLICATIONS:
USER AUTHENTICATION AND ACCESS CONTROL FOR BIKE SHARING

Bike share systems are springing up in urban centers, large campuses and tourist destinations around the globe. Bike sharing (and its sibling, scooter sharing) provide a convenient and economical transportation option that bridges the gap between public mass transit and taxi or ride share services.

For communities and companies implementing bike share programs, the biggest challenge is balancing the need to provide efficient access for authorized users and the need to protect highly portable assets from theft, vandalism and unauthorized use. User authentication and access control systems can help bike share companies and system managers achieve both aims.

RFID FOR USER AUTHENTICATION AND ACCESS CONTROL IN BIKE SHARING

The bike share market can be broadly divided into three segments:

- **Station-based (or docked)** systems utilize fixed physical hubs with infrastructure for securing the bikes. These docks are often located near transportation hubs to provide "last mile" transit for commuters.
- **Dockless** systems do away with the station infrastructure. Users can locate available bikes using an app-based geolocation system and leave bikes anywhere within a defined geographic range.
- **Hybrid** systems combine elements of both models, often incorporating "virtual stations" and smart locks to increase bike security and reduce management headaches.

All of these models require easy, effective user authentication and access control systems.

- **User authentication** is the ability to correctly identify an individual user and match their information to the vehicle, equipment or systems they are using.
- **Access control** is the ability to ensure that only authorized users are able to gain access to an asset or system.

User authentication and access control solutions ensure that only riders who are subscribed to the bike share program are able to use the bikes. They can be attached to the dock system in a station-based bike share model or to the bike itself for dockless bike share programs.

Radio-frequency identification (RFID) cards are already widely used for access to metro transportation systems, sometimes providing "all access" solutions for both bus and subway systems. These same cards can be leveraged to provide user authentication and access control for bikes and scooters. RFID is an economical and easy solution that many commuters are already carrying in their pockets.

RFID APPLICATIONS FOR THE BIKE SHARE MARKET

RFID-enabled user authentication and access control systems can be integrated into both docked and dockless bike share systems. RFID cards are cheap to issue, easy to manage and easy for users to carry and deploy. They may also be a more equitable solution to provide access to commuter bikes in low-income communities where smartphone credential use may not be universal. Users simply wave the card to unlock the bike and record their transaction. The card identifies the individual user, allowing bike share managers to link user identities with the bikes they are borrowing and usage data.

RFID readers can be incorporated into bike share programs in several ways.

- **Station infrastructure:** For station-based models where bikes are returned to and locked to a physical dock, the RFID reader can be built into the locking mechanism in the dock. Users unlock the bike from the dock by presenting their card over the reader attached to the locking mechanism.
- **Bike electronic controls:** Bikes used in dockless bike share systems may have an electronic control box that enables GPS tracking and communication between the bike and back-end management systems. The RFID reader can be housed within the electronic control box to enable access.
- **Smart locks:** Some bike share systems rely on smart locking mechanisms that render the bike unusable until unlocked by an authorized user. RFID readers can be coupled to the smart lock system to ensure that the right person is unlocking and using the bike.

EMERGING USER AUTHENTICATION AND ACCESS CONTROL SYSTEMS FOR BIKE SHARING

The bike share market is evolving rapidly, and user authentication and access control systems are evolving right along with it. Currently, there are several approaches to user authentication and access control available to bike share companies and equipment manufacturers.

Some of these rely on smartphones to identify users and unlock the bike when the right user approaches. For dockless bike share systems, users typically rent and locate an available bike using a mobile app that guides them to the location where the bike can be found. The same smartphone that riders use to locate the bike can then be used to unlock it, either through Bluetooth Low Energy (BLE) or Near Field Communication (NFC) signals or by providing a numeric pin or scannable QR code.

With the market still in so much flux, the best bet for bike share companies may be a reader that can be programmed for both RFID cards and smartphone technologies—like ELATEC's MultiTech readers. This enables companies to serve multiple markets and evolve as user expectations change. For example, the same reader could be used for commuters accessing bikes using their metro transit cards and transient visitors unlocking bikes using a smartphone app. This approach enhances equity and access by ensuring that both local commuters (some of whom may not own smartphones or have consistent service) and visitors (who may not have a metro card) can access the bikes using the system that works best for them.

As the bike share market continues to grow, we are likely to see a mix of docked, dockless and hybrid systems emerging in different markets. Bike share companies will need flexible, "future-proof" user authentication and access control solutions that will allow them to serve the widest possible market and prepare for the challenges of tomorrow.

WANT TO KNOW MORE ABOUT RFID SOLUTIONS FOR THE BIKE SHARE MARKET?

Download our white paper for a comprehensive look at RFID solutions for the bike share industry.

User Authentication and Access Control in Bike Sharing: A Guide to Use and Selection

You'll learn:

- How RFID systems work and the different types of RFID technologies
- The benefits of RFID, and why RFID is the simplest solution for bike share systems
- Challenges that bike share companies face when implementing RFID solutions for bike sharing
- How ELATEC helps bike share equipment manufacturers access new markets, reduce total lifecycle costs, and develop "future-proof" solutions that deliver real customer advantages

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