




FEIG Electronics cVEND Pays Off with Performance, Security for Contactless Fare Collection Systems





Millions of passengers rely on buses, subways and trains for their daily commute. In fact, Americans took 14 billion trips via public transportation in 2015 alone, accounting for more than \$17 billion in fare revenue.

In order to streamline operations and improve passenger satisfaction, transit operators have been searching for new ways to speed up fare collection. The growing popularity of contactless payment offers the perfect solution for fast, secure payment transactions, while reducing maintenance and security costs associated with handling cash for small payments.

The most common contactless payment form factor is a contactless plastic card, although other types include the key fob, wristband, watch or mobile phone. Contactless payment is made possible by radio frequency identification (RFID) and near-field communications (NFC) technologies that transmit payment information over a short range when the cardholder taps or waves the card near a secure reader. Contactless payment offers transit riders increased convenience, security and flexibility.

To take full advantage of contactless fare collection, transit authorities across the globe are modifying traditional closed loop systems to accept third-party bankcards and NFC payment apps on smart phones.

FEIG Electronics cVEND® payment platform combines contactless reading and secure payment processing into a small EMV level 1 and 2, PCI PTS certified device, ideally suited for any next-generation fare collection box or payment terminal.

Forward Momentum

The need to replace legacy contact readers is forcing consideration of entirely different hardware platforms. Since most existing contactless fare collection systems are unable to support the latest payment and security standards. Without the capability to transition or provide a migration path forward, these existing devices must be upgraded.

Given the magnitude of upgrading payment systems, many municipal transit authorities are looking to future-proof their investment in new hardware deployments with the latest technology advancements. Likewise, successful payment system integrators are building flexibility and agility into the design of their next-generation system architectures.

Yet transit payment systems present their own set of challenges. Deployed equipment must be robust enough to withstand the demanding operating environment. Not only do payment transactions need to be secure, but they also need to be fast enough to keep pace with peak passenger volume to prevent bottlenecks.

Although a contactless payment terminal is a small component with a relatively small cost in proportion to the overall system, it has a huge impact on the underlying factors that determine operational performance and efficiency.

Born to Ride

FEIG Electronics offers a complete product line designed to meet every consideration of transit payment systems. The cVEND platform represents the evolution of secure contactless payment and ticketing for use on transport vehicles, as well as stationary ticket vending machines.

The cVEND system can accommodate both primary types of contactless payment system in use today: the closed-loop system that accepts prepaid tickets or loyalty cards, and the open-loop system that uses contactless bank credit cards, prepaid debit cards or similar payment methods. With this flexible platform, cVEND offers a secure, reliable payment solution for mobile and self-service ticketing, cashless parking applications, loyalty programs and NFC payments, regardless of the mobile device platform.

This versatile platform is available in three hardware configurations: cVEND plug is an embedded module intended

for flush integration into non-metallic enclosures; cVEND box, a module intended for flush integration into metallic enclosures; and the cVEND box+ with a two-line display window. All three products are based on the same core processor, reader hardware and software to suit a variety of applications within a transit system, including validators, turnstiles, vending machines and self-serve kiosks.



cVEND accepts nearly any card that may be presented it, supporting the widest variety of payment and fare collection media including contactless credit cards (MasterCard, VISA, American Express, Discover), contactless tickets (VDV-KA, ITSO, Calypso) and contactless payment applications such as Apple Pay, Google Wallet and other NFC-based apps.

The flexibility of the cVEND platform allows rapid deployment to upgrade legacy installations to create a migration path from closed-loop systems to contactless, open-loop with the same hardware platform. This future-proof design helps protect the hardware investment of municipal transit authorities.

To further protect this investment, cVEND is housed in a rugged, weather-proof, impact-tested, environmental protection class enclosure designed to withstand mechanical shock and the constant physical vibrations of buses and trains. Rugged cVEND card reader and plug-in devices have demonstrated compliance with International Electro technical Commission (IEC) standards IEC 60068-2-6 Environmental Vibration Test and IEC 60068-2-27 Environmental Shock Test.

Speed and Security

When it comes to optimizing transit operations, milliseconds count. As a result of FEIG Electronics' decades of experience in RFID reader and antenna design, cVEND's internal antenna offers outstanding performance, exceeding the EMV level 1 specification for the detection area for contactless cards. This greater detection range translates to faster transaction times, demonstrating noticeably faster card capture with both open and closed-loop cards, versus readers with a lower detection range.

Yet, speed is just part of the equation. cVEND is the only device on the market that is PCI and EMV certified for maximum security. Offering EMV Level 1 and 2 certification, cVEND is PCI PTS certified as a non-PIN entry device, supporting open protocol and incorporating the mandatory SRED module. As a secure reader for the exchange of data, the SRED module ensures that cardholder account data is protected at the point of acceptance, meeting the required security considerations for the broader point-to-point security process.

Tamper mechanisms are incorporated in cVEND that trigger a flashing red LED, an audible alarm buzzer sounding, and a tamper message sent over the serial interface in the event of physical penetration of the device. In addition, a self-test is performed every 24 hours and upon each start up to verify the integrity of the firmware and user application running on the device. Should the self-test fail, the device goes into an out-of-service status.

To further secure the device from tampering, only applications that have been digitally signed are granted access to sensitive services, such as the key store. A PIN-protected USB Smart Card Hardware Security Module (HSM) is provided to integrators for signing applications.

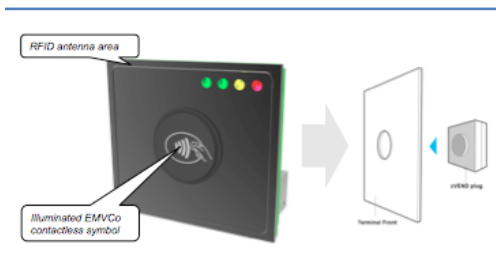
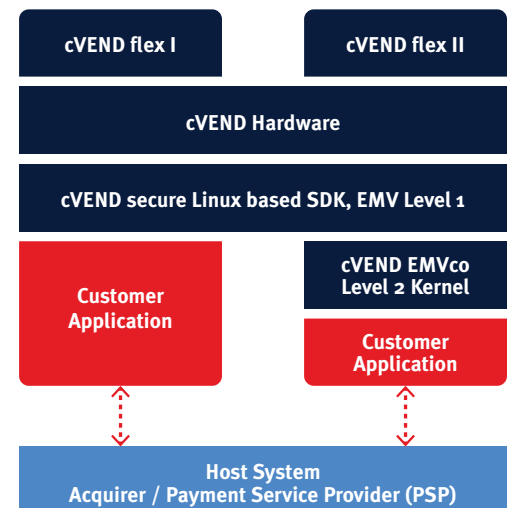
Designed to comply with all transit standards, cVEND supports ISO 14443-A / B in EMVCo contactless mode, NFC passive initiator mode (IP1) peer to peer (P2P) and card emulation enabled hardware, and Sony Felica transparent communication channel. Furthermore, the platform supports all compliant contactless smart card standards, mifare classic, mifare DESFire, mifare Ultralight and Ev1.

Simple Integration in a Snap

cVEND's software architecture provides integrators with a variety of interface options. Such flexibility is an innovative concept that allows an integrator to use the platform as a foundation to upgrade existing installations with capability to expand with the needs of future requirements, reducing deployment time considerably.

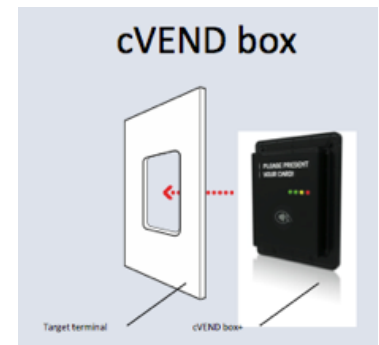
Furthering the concept of flexibility, cVEND has a secure embedded Linux operating system running on an attack-resistant processor with real-time encryption. FEIG offers a fully supported, high-level software development kit (SDK) and an easy to use application program interface (API) to access hardware features, card interfaces, payment transactions and data exchange. Integrators can develop open and/or closed-loop payment applications to run directly on the device, eliminating the cost associated with additional hardware. This has the added benefit of reducing transaction time by avoiding latency created between terminal and host communications.

cVEND Solutions



The face of the cVEND plug is just slightly larger than a credit card.

As an embedded device in a terminal, kiosk or turnstile, cVEND can be branded by the integrator or transit authority. Intended to be flush-mounted in a non-metallic enclosure, only the illuminated target on the cVEND plug device is visible to the user, providing a clearly defined location for the contactless card.



The cVEND box uses a similar concept as the cVEND plug, however the face of the unit is larger to compensate for mounting in a metal enclosure, positioning the antenna a sufficient distance away from the metal to maintain an outstanding reading performance.

Coasting to Tomorrow

The interest in contactless technology and pace of adoption will continue to increase as transit authorities create greater convenience and ease of use for passengers, improving the overall commuter experience. The ability to use a contactless bankcard or smart phone to pay for travel not only saves time for passengers, it also saves money for transit operators, reducing operational costs, increasing accountability and eliminating the need for traditional paper tickets.

cVEND has already caught the interest of several major rapid transit stations in the United States. FEIG's flexible cVEND platform supports open and closed-loop, loyalty, prepaid or other payment formats, enabling potential new and expanded revenue opportunities. cVEND offers the best available solution to build a solid migration path to tomorrow, with a design matched to keeping passengers moving as quickly and efficiently through the payment process as they do through the transit system.

About FEIG ELECTRONICS, Inc.

FEIG Electronics, a leading global supplier of RFID readers and antennas, is one of the few suppliers worldwide offering RFID readers and antennas for all standard operating frequencies: LF (125 kHz), HF (13.56 MHz), UHF (860-960 MHz). A trusted pioneer in RFID with more than 40 years' industry experience, FEIG delivers unrivaled data collection, authentication and identification solutions, as well as secure contactless payment systems with its OBID® RFID products. FEIG readers, available for plug-in, desktop and handheld applications, support next-generation contactless credit cards, debit cards, smartcards and NFC applications to enable fast, accurate, reliable and secure authentication and payment transactions.



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