The reason you need for Devices Designed Specifically for Commercial Use and Precisely Tailored to Workplace Needs

Solutions for retail and other service businesses that provide support for things like card payments, POS (Point-of-sale), and reservations have become widely available in recent years. This includes solutions that, along with in-store POS terminals and back-office consoles, also incorporate mobile devices with the flexibility to be used by staff anywhere in the store. In addition to enabling back-office tasks such as accessing information or managing inventory, these solutions are now capable of transforming the way in which staff interact with customers.

Normally, such mobile-enabled solutions is to use ordinary consumer devices. Unfortunately, major problems arise because these devices are not ideally suited to the needs of the workplace. For example, while a high level of security is required for making card payments on a mobile device to ensure the secure handling of the card reader and card information, implementing such a card payment function on existing devices is technically challenging. Also, many such devices lack the toughness, dust/water resistance, and antibacterial properties needed for use in harsh environments. Accordingly, devices designed specifically for commercial use that can be relied on to satisfy workplace needs will have a key role as advanced solutions for retail and other server businesses are adopted more widely in the future.

Complete “Made in Japan” EMPATHY EM Series Devices Designed Specifically for Commercial Use and Reliable in Harsh Workplaces

The latest such device designed specifically for commercial use is the EMPATHY EM Series from Empathy Co., Ltd (hereafter “Empathy”). Empathy began as a company involved with SaaS services, including card payments and POS systems. However, while its applications underwent ongoing enhancements over time, the company discovered that it was unable to find the devices it needed to make the most of these applications. When they tried working with an overseas vendor to develop commercial devices, what they then found was that the hardware designed and manufactured overseas repeatedly failed to satisfy their quality requirements, or else presented difficulties when trying to implement credit functions specific in Japan.
From this history, they obtained the collaboration of a major Japanese electronics company for the EMPATHY EM Series and established a design and production infrastructure based at its Japanese operations. Along with the high quality and reliable design that comes from Japan’s *monozukuri* manufacturing ethos, the series are also extremely robust, giving users the confidence to deploy them in harsh workplace environments. As a result, users can make full use of the EMPATHY EM Series in both indoor and outdoor environments, with features that include being tough enough to survive a fall of up to 1.2 m, IP65-level dust and water resistance for all-encompassing protection (including the magnetic stripe, IC and NFC reader, and metal contacts), and excellent antibacterial properties to ensure they can be handled hygienically.

Three Built-in Card Reading Mechanisms to Support All Forms of Card Payment

The EMPATHY EM Series consists of the EMPATHY EM10 featuring a large 10.1-inch touch panel for easy screen viewing and the EMPATHY EM08 with an 8-inch touch panel designed for portability. The EMPATHY EM Series has readers for magnetic stripe cards, contact chip cards (EMV), and non-contact chip cards (NFC) to support common card payment mechanisms such as credit cards, electronic money, and NFC. The devices also provide a built-in IEEE802.11b/g/a/n/ac wireless LAN function as a standard feature, and WAN function as an option. These wireless communication functions enable data communications with back-end management or payment servers to be performed anywhere and anytime.

Accordingly, because the EMPATHY EM Series handle credit card and other personal customer information, the security of the devices has been considerably strengthened. The series have been certified under a number of certifications, including Payment Card Industry PIN Transaction Security (PCI PTS), established by five international card brands, and the Europay, MasterCard, and Visa (EMV) standard established by major credit companies. In addition to obtaining these certifications to maximize security, the devices also have a function that deals with devices being lost or stolen by automatically erasing any data they contain if a third party attempts access. Another function provides the option of entirely disabling the device by physically destroying its internal circuits. If this function is triggered, the device can never be used again (cannot even be powered up).

The Latest Intel® Atom™ Processor as the Heart of the Device

EMPATHY EM Series uses a hardware platform based on the Intel® architecture, at the heart of which is an Intel® Atom™ processor E3800 family (development code name: Bay Trail) CPU designed for embedded applications. The E3800 family of microprocessors is based on the Intel® architecture that is used extensively in the realm of PCs and servers, combining this with even greater miniaturization and low power consumption. As they use very low power and generate little heat, the family supports fanless designs for microprocessor cooling.

By utilizing these distinctive strengths of the Intel® Atom™ processor, the EMPATHY EM Series not only deliver the level of processing performance needed to comfortably run the wide range of applications developed by Empathy for retail and other service businesses, they also feature a small and lightweight design for easier handling by workplace users, and an 8-hour-plus battery life to ensure that a full charge will last an entire working day (the device battery packs are also swappable). While the EMPATHY EM08 currently weighs only 480 grams, they aim to reduce this yet further through enhancements to the case design of the upcoming model. Furthermore, the Intel® Atom™ processor E3800 family has a system-on-chip (SoC) configuration that includes a number of I/O functions. With a built-in camera image and video processing circuit, the EMPATHY EM Series can also control both its front and rear cameras simultaneously.
Security Strengthened Significantly with Windows*

The EMPATHY EM Series uses Microsoft® Windows® Embedded 8.1 Industry as its operating system (OS). Based on the Windows® 8.1 OS that is well-established in PCs and other devices, Windows® Embedded 8.1 Industry incorporates additional functions for embedded applications and is widely used in "edge devices" in such industries as retail, manufacturing, and healthcare. By adopting Windows® 8.1, the EMPATHY EM Series wins out in numerous ways over devices based on different OSs, including its excellent compatibility with existing applications, extensive support for peripheral devices, and operation familiar from previous Windows® clients. Also, various back-end systems that provide information to the EMPATHY EM Series are hosted on the Microsoft® Azure® public cloud service. Using a Windows® platform for both the back-end systems and EMPATHY EM Series significantly enhances their mutual affinity with regard to data communications.

While Empathy originally tested devices running other OSs, the problem with these was that they could not guarantee the high level of security essential to the use of built-in card payment functions. Accordingly, they selected the Windows® platform, which allows for the flexible combination of an extensive range of security solutions, to be the core OS for the EMPATHY EM Series. The EMPATHY EM Series uses the McAfee* Embedded Control solution for protection from threats such as malware and tampering, providing it with the highest class of security currently available.

McAfee* Embedded Control is the latest end-point security solution designed for use in embedded systems. It provides application control whereby only a predefined white list of applications are permitted to execute. As the software environment for embedded systems involves running a restricted or fixed set of applications, the white list approach of only permitting execution of predefined applications is an effective form of control. McAfee* Embedded Control also prevents unauthorized software modifications to embedded systems, and provides software update control to enable the equipment manufacturer or service channel to control an end-user's embedded system after configuration and delivery.

**All Forms of In-Store Card Payments Handled by EMPATHY EM**

Empathy’s card payment systems support all the different types of card payments used in Japan, including credit cards and electronic money. They have also obtained a variety of security certifications to verify that these card payments can be performed securely. Examples include the PCI PTS international security standard for protecting confidential information such as personal identification number (PIN) and credit card data, compliance with the EMV standard for the trustworthiness and security of credit and bank debit cards with integrated circuit (IC) chips, and support for the Derive Unique Key Per Transaction (DUKPT) key management scheme for encrypting credit card information sent from the terminals to the payment server.

The integration with Empathy’s powerful card payment systems made possible by the EMPATHY EM Series means that a single device provides all needs to offer card payments. Likewise, the portability made possible by the device’s lightweight body is another major strength, enabling it to demonstrate its full capabilities in numerous different business situations. In addition to offering card payments from anywhere on the premises in hospitality, retail, or department store for example, the dust/water resistant design of the EMPATHY EM Series also means that card payments can be provided at such locations as unroofed terraces, street stalls and other temporary outdoor stores, or parks. By effectively combining the EMPATHY EM Series with its card payment systems, Empathy has active plans to deploy its solutions to various different industries, particularly small and medium-sized retail and service businesses that want to offer a variety of different payment mechanisms at a low cost.

**Next-Generation Store Management is available by the Latest Empathy Solution**

From the business started, Empathy has been developing retail and service industry applications that feature designs with a strong visual impact and user interfaces that workplace staff can use intuitively. This experience in application development means the company can offer a diverse portfolio of commercial systems, including POS systems, electronic money systems, and reservation systems as well as card payment systems. With the release of its EMPATHY EM Series of devices designed specifically for commercial use, next-generation store management incorporating the company’s extensive range of applications has now become a realistic option.

**POS system**

The POS system provides dashboard screens for the display and use of essential operational information, such as sales, reservation data, customer numbers, and best-selling products. In addition to supporting different forms of card payments, including payments in other currencies from overseas tourists through integration with the card payment system, the system also has the potential to operate as a new type of cash register through Bluetooth® connections to peripherals such as cash drawers and printers. The system also has the scope to evolve further through integration with ordering, digital signage, and other systems to help make stores more profitable or attract customers.
Electronic Money System
The electronic money system provides functions for issuing, managing, and utilizing store-issued electronic money. In addition to its core electronic money, point, and gift functions, the system also has features that provide a high level of convenience to customers, including promotion, introduction, and currency exchange functions.

Reservation System
The reservation system provides the infrastructure to enable reservations and confirmations to be offered 24 hours a day for a four-piece combination of date and time, product, location, and identity, while also providing information such as store layout and staff.

Brand New Taxi Solution Using EMPATHY EM Series
Empathy has also begun directing its efforts at uses outside the retail sector. One example is a proprietary taxi solution that consolidates the functions required for taxi operations. Together with the EMPATHY EM Series, Empathy’s taxi solution provides vehicle management functions that collect information such as distance travelled and status, and also functions such as interoperation with the taxi meter, car navigation, dispatch, and the ability for customers to pay by card. It also uses the built-in front and rear cameras on EMPATHY EM Series devices as an in-vehicle camera and drive recorder. In this way, fitting an EMPATHY EM Series device in a taxi enables all of its required hardware (including its meter and card payment unit) to be consolidated into a single device.

Example of taxi solution screen