

# SONY®

Contactless IC Card Technology  
<FeliCa>

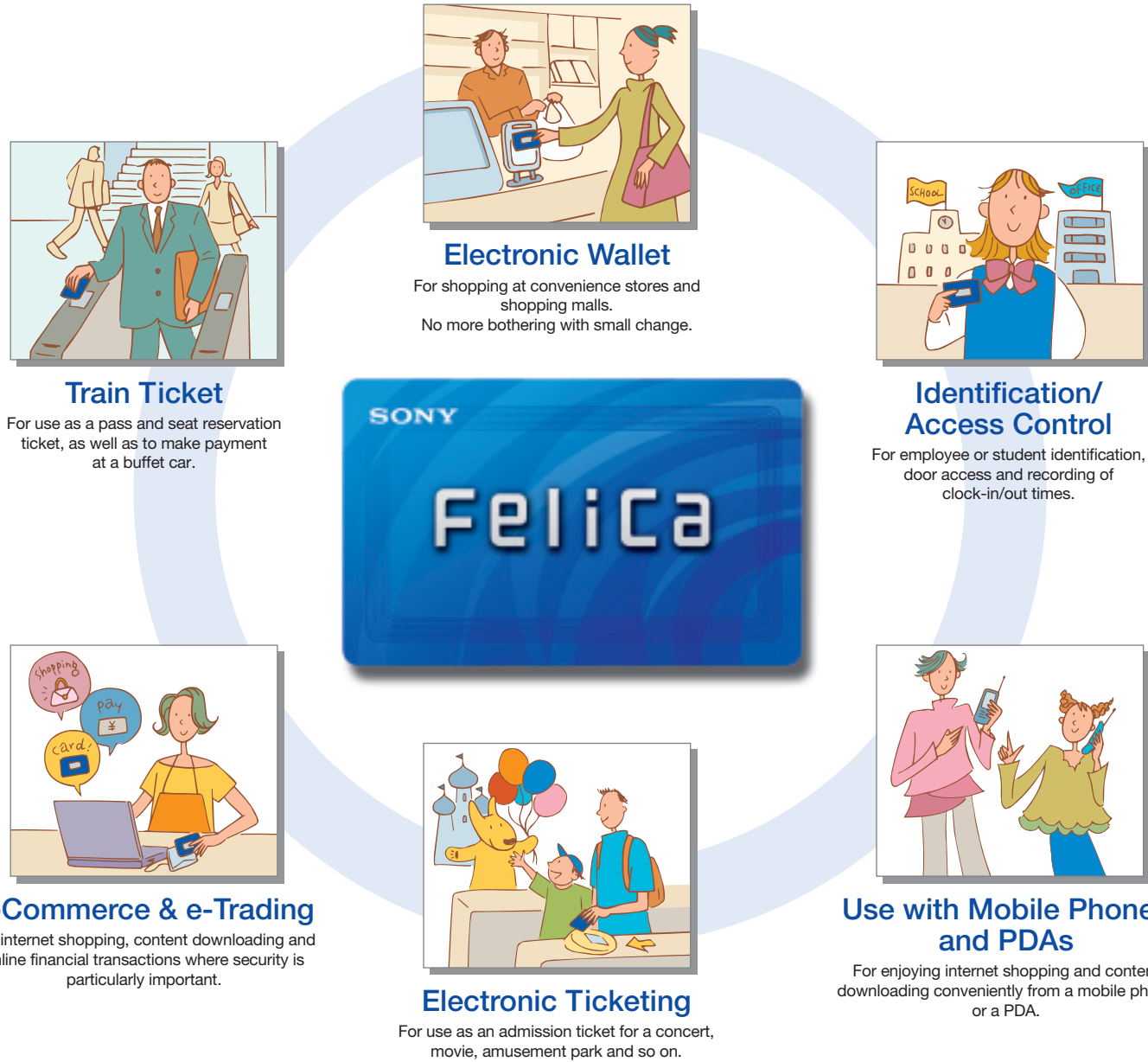


**International Standardization  
Further Expands Application Possibilities.**

# Single-Card, Multi-Application FeliCa Technology

## Now Established as International Communication Standard

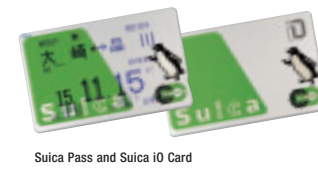
FeliCa is Sony's contactless IC card technology that allows easy access to multiple services through a single card, as well as exceptionally secure, high-speed processing. Building on the ISO/IEC approval of its communication format (ISO/IEC 18092), this technology will now find an even wider range of applications. With no need to carry many cards, FeliCa continues to add convenience and efficiency to daily life.



## Typical Uses of FeliCa Technology

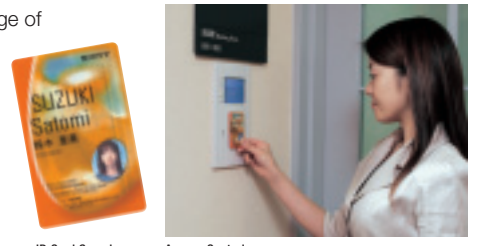
### Commuter Tickets

In Japan, FeliCa is providing an ideal solution for a variety of AFC (Automatic Fare Collection) systems, including JR East's "Suica iO" card that completely eliminates the need to buy tickets. In the central part of the country, a similar service using the "ICOCA" card has been introduced by JR West, and the "PiTaPa" card that can be used for 42 transportation systems is being planned by SURUTTO KANSAI Association. FeliCa is also used for the commuter bus service in Nagasaki under the name "Nagasaki Smart Card."



### ID Card

The FeliCa advantage of multi-application capability makes it possible to apply a single card to a variety of requirements, such as employee identification, access control and recording of clock-in/out times. When cash card functions are added, the same card can also be used to make payment at in-house shops and cafeterias.



### Internet Shopping

Simply by putting the card on a FeliCa reader/writer connected to a PC, the "eLIO" card of Sony Finance International lets you identify yourself instantly and shop safely on the web. The recently introduced "My Sony" card combines the functions of the eLIO internet credit service with the Edy electronic money system to offer the widest possibilities for user convenience.



### Airline Mileage Service Program

The "ANA MILEAGE CLUB" card incorporates the "Edy" electronic money service function. Card Holders can accumulate mileage for payment using "Edy" and exchange accumulated mileage for "Edy".



### Electronic Money

The "Edy" electronic money service started by bitWallet, Inc. can be used to make payments at a number of participating retail outlets including "am/pm" convenience stores. Payment using the "Edy" card is quick and simple, with no need to be bothered with small change.



## FeliCa Use Spreading Around the World

**Hong Kong** Used for a whole host of applications, from transportation systems to vending machine payments, the FeliCa-based "Octopus" card is already a part of everyday life.



**Singapore** Under the supervision of the Land Transport Authority (LTA), "ez-link" automatic fare collection systems have been established for public transportation facilities.



**India** In Delhi, a value-chargeable "TRAVEL Card" has been adopted. Coin-shaped one-way and round-trip FeliCa tokens have also been introduced.



**China** FeliCa is used as the "Trans Card" bus ticket in Shenzhen. In the near future, the Trans Card will also be applicable to taxis and subways, making it possible to move around the city with a single card.



**USA** Providing efficient attendance checking and enhanced security, a FeliCa-based student management system has been introduced in some public high schools.



### ISO/IEC 18092 Standard

Near Field Communication (NFC IP-1) technology, developed jointly by Sony Corporation and Royal Philips Electronics, has been standardized internationally under ISO/IEC 18092.

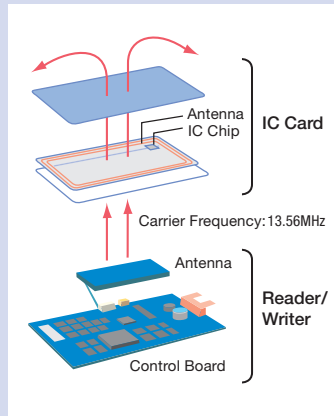
The standard specifies device-to-device radio-frequency communications and fully encompasses Sony's FeliCa technology. Defining no physical specifications, it makes it easy to design products of non-prescriptive size and shape.

ISO/IEC 14443	Type B	Type A	FeliCa	NFC	ISO/IEC 18092 (NFC IP-1)
Part 4 Communication Protocol	Type B Protocol	Type A Protocol	FeliCa Protocol	Transport Protocol	
Part 3 Collision Detection/Prevention	Slot Marker	Bit Collision Time Slot	Time Slot	Bit Collision Time Slot	
Part 2 Wireless Communication	106kbps~	106kbps~	212kbps	424kbps	
Part 1 Physical Specifications	Card Type	Card Type	Card Type		

# FeliCa Technology

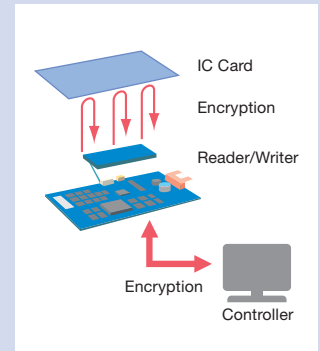
## Contactless Operation

Transactions between the card and the reader/writer, including reading and writing of data, are possible by simply bringing the card close to the reader/writer. There is no need to take the card from the pass case or wallet. The card contains an IC chip and antenna but has no battery to ensure maintenance-free durability. It is activated by low-power electromagnetic signals received from the reader/writer.



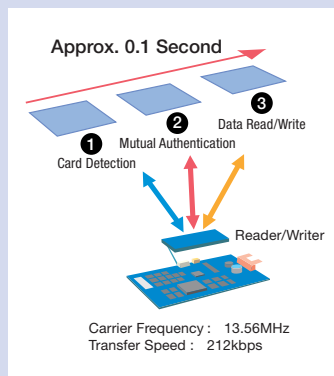
## Assured Security

Mutual authentication between the card and reader/writer is based on a secret key system using internally generated random numbers. All communications between the card and reader/writer (or between the reader/writer and controller) are encrypted using these numbers, while keys are changed according to application to safeguard against data interception and falsification. As the result, FeliCa offers the security required to handle financial and administrative applications, including electronic money, online payment and personal identification.



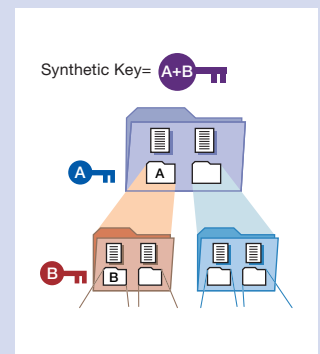
## Unmatched Processing Speed

All processing, from card detection to authentication and data read/write, is completed in only 0.1 second. At 212 kbps, data transfer speed is almost twice as fast as that of other smart cards. FeliCa fully meets the requirements for high-speed processing in access applications, such as electronic tickets in public transport and company or government issued ID cards.



## Multi-Application Potential

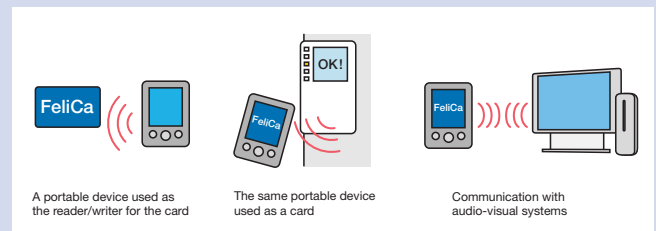
The card contains individually managed multiple files and directories. That's why FeliCa can offer multiple services on a single card. In addition, different keys are set to individual files in order to guarantee security among the services sharing the same card, as well as to allow fast, simultaneous access to different services.



## Symmetrical Communication System

Adopting symmetrical communication system, FeliCa makes it easy to integrate both IC card and reader/writer functions into a single, compact device. Communication between such devices is also possible.

This means that FeliCa has the potential to be used in a variety of new ways in new types of applications, such as a mobile phone that can function not only as a card but also as a viewer for checking the card data.



## EAST ASIAN COMMON SMART CARD

FeliCa has been adopted by the Policy Research Institute for Land, Infrastructure and Transport for an international pilot project for examining the feasibility of transportation IC cards that can be used not only in Japan but also in other countries.



## Products (for Service Providers)

Sony offers a complete set of IC card, reader/writer and application software development kit.

- **Contactless IC Card** Easy-to-use, with outstanding security performance to meet the requirements of various applications.
- **Contactless IC Card Reader/Writer** Composed of a controller and antenna that allow high-speed communication with the card.
- **SDK for FeliCa (Development Kit)** Operates on a Windows PC for efficient development of FeliCa applications.

• FeliCa is a trademark of Sony Corporation. • Suica is a registered trademark of East Japan Railway Company. • ICOCA is a registered trademark of West Japan Railway Company. • Edy is the name of the prepaid electronic money service of bitWallet, Inc. • Octopus is a trademark of Octopus Cards Limited. • All names of companies, products and systems contained herein are trademarks or registered trademarks of the respective companies even without the trademark indications of © or TM. • Design and specifications are subject to change without notice.

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