GS1 Hong Kong

Discovering EPC
齊來認識產品電子代碼

What is EPC?
甚麼是產品電子代碼?

Electronic Product Code™ (EPC) is a numbering system, which works with Radio Frequency Identification (RFID) technology and global communications networks, to track and trace goods as they move through the global supply chain. When an item carries an RFID tag embedded with an EPC number, its origins, date of production and other information can be discovered simply by scanning the RFID tag and accessing a secure remote computer database.

EPC is the global RFID standard for numbering in the supply chain management space. As its adoption has spread, EPC is helping more and more businesses to control product quality, deliver goods on time and achieve optimal supply chain efficiency, which ultimately benefits the consumer.

產品電子代碼是一套連結無線射頻識別技術、全球通訊網絡使用的編碼系統，用以追蹤及追溯物件在全球供應鏈內的流向。當物件附有產品電子代碼的無線射頻識別標籤，只要掃描標籤及登入遠程保安資料庫，便得知物件的來源地、生產日期及其他相關資料。

產品電子代碼是用於供應鏈管理的全球無線射頻識別技術編碼標準，由於已被廣泛採納，產品電子代碼正協助更多企業監控產品質素、準時付運，使供應鏈達至更理想的效率，最終讓客戶獲益。

Quick Facts EPC速覽

Why do enterprises use the EPC?
為甚麼企業會使用產品電子代碼？

EPC facilitates information sharing, and tracking and tracing of objects moving through the supply chain. This improves internal production and logistics processes, helping enterprisees do business more efficiently.

產品電子代碼令資料分享更便捷，追蹤及追溯供應鏈內的物件更容易，這樣既改善了內部生產和物流程序，亦協助提升企業營運效率。

How EPC numbering works?
產品電子代碼如何運作?

An EPC number is comprised of two building blocks. The first block is assigned by EPCglobal and consists of a header and an EPC Manager number. The second block is assigned by the company which owns the EPC Manager number. Together the two blocks make up a unique identification code for an item.

一個產品電子代碼由兩個構件組成。第一個構件由EPCglobal指定，包含前置編號及EPC管理單位代碼；第二個構件則由擁有EPC管理單位代碼的公司指派。兩個構件組成一個獨一無二的識別編碼予物件。

Managed by EPCglobal
由EPCglobal管理

Managed by the company
由公司管理

Header 前置編號	EPC Manager Number EPC管理單位代碼	Object Class 物品類別	Serial Number 序號
48	4009419	012368	000000123456

Defines the type of code scheme being used (e.g. SGTIN, IATA, ISBN etc.)
界定被使用編碼方案的類型 (例如SGTIN, IATA, ISBN等)

Allocated to a company by EPCglobal
由 EPCglobal 分配給公司

Refers to the class or type of product (e.g. ABC Orange Juice)
歸類物件的種類或類型 (例如ABC橙汁)

Identifies each unique item of the object class (e.g. individual bottle of ABC Orange Juice)
識別物件類別中每件獨一無二的物件 (例如個別的ABC橙汁)

What is RFID?
甚麼是無線射頻識別技術？

Radio Frequency Identification or RFID is a technology which uses radio wave communication to identify items. RFID technology has existed since World War II when it was used to distinguish friendly aircraft from enemy ones, and started to find commercial applications in the 1970s. Today it is one of the most powerful technologies for managing complex global supply chains.

In a typical RFID system, an item is given a tag, which will transmit a unique identity code when it is interrogated by a reader. This unique code is then used to look up information about the product on a computer database.

RFID technology allows automatic object identification without line of sight, unlike barcode scanning. In addition, RFID tags can transmit and receive data, allowing them to be updated with new information as they move through the supply chain.

無線射頻識別技術或RFID是一項使用無線電波通訊來識別物件的技術。無線射頻識別技術自二次大戰起便已出現，當時主要用於分辨敵我兩方的戰機，直至七十年代才開始在商業上應用。今天它更成為管理全球複雜供應鏈的最強大技術。

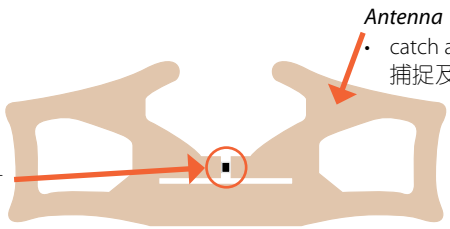
在典型的無線射頻識別系統內，物件會附有標籤，當閱讀器讀詢後，它會傳送獨一無二的識別編碼。這個識別編碼會用來在電腦資料庫內尋找相關產品資料。無線射頻識別技術有別於條碼掃描，它容許在沒有瞄準線下自動識別物件身份。此外，無線射頻識別標籤能傳送及接收數據，讓它們能隨時於供應鏈內更新資料。

Typical RFID System Component
典型無線射頻識別系統組件

1. The reader sends energy and data in the form of radio waves to the tag
閱讀器以無線電波, 向標籤發出能量及數據
2. The tag transmits its identify back
標籤回覆其身分
3. The reader receives and decodes the signals
閱讀器接收並解讀訊號

The heart of RFID technology is a tag consisting of a tiny silicon chip with an antenna. The chip in the tag contains information about the item that it is either attached to or embedded in. A unique number is generally stored on the tag for encrypting information which is transmitted to a reader using radio signals and stored in a database for access by authorized users.

無線射頻識別技術的核心是內藏細小矽片和天線的標籤，標籤內的矽片包含附上或嵌入的物件資料。標籤內一般會儲存一個獨一無二的編碼，把資料加密，並利用無線訊號傳送給閱讀器，然後儲存在資料庫內，給已授權的用戶取用。



A RFID tag
無線射頻識別標籤

How EPC/RFID is improving our quality of life?
產品電子代碼 / 無線射頻識別技術如何改善我們的生活質素?

RFID technology combined with the EPC numbering system today is being used in a wide range of industries to improve quality of life for consumers.

今天，結合了產品電子代碼系統的無線射頻識別技術已廣泛應用於不同行業上，藉以改善消費者的生活質素。

Safer, more efficient healthcare
更安全、更有效率的醫療保健

Hospitals are using RFID to track blood samples and medicine and match them with patients who wear RFID-enabled bracelets. Drug manufacturers are leveraging RFID technology to prevent counterfeiting by embedding product packaging with EPC tags. These RFID applications are making healthcare safer and faster.

醫院使用無線射頻識別技術來追蹤血液樣本和藥物，並與戴上用無線射頻識別手帶的病人配對。藥物製造商則採用無線射頻識別技術，把產品電子代碼標籤嵌入產品包裝內來防範偽冒產品。這些無線射頻識別技術的應用令醫療保健更安全、更便捷。

Better food quality
更好的食物質素

RFID is used to monitor and maintain the quality of food products - like eggs, cheese, pork and beef - and track their source to guarantee their freshness, authenticity and origin.

使用無線射頻識別技術來監控及保持食物產品質素，例如雞蛋、芝士、豬肉和牛肉等，並可追蹤其來源以確保食物新鮮、真確性及出產地。

Quick Facts EPC速覽

Can RFID tags be recycled?
無線射頻識別標籤能否循環使用？

Many companies reuse their RFID tags hundreds of times over in closed-loop applications. Tag data can be rewritten or modified.

很多公司在閉環操作系統內循環使用無線射頻識別標籤上百次，標籤內的數據亦能夠重寫或修改。

Satisfying shopping experience
更滿足的購物經驗

RFID technology is helping retail outlets to lower operational cost and avoid running out of stock. It is also enhancing the shopping experience by making product information more easily accessible, resulting in a more self-guided shopping experience and increased customer satisfaction.

無線射頻識別技術協助零售商店減低營運成本及避免缺貨情況。同時亦透過更容易獲取的產品資料，提升購物經驗，實現自主購物及增加消費者的滿足感。

Pleasant journeys
更愉快的旅程

RFID is making airports more efficient and user-friendly by using RFID for luggage sorting, reducing incidents of lost luggage. Additionally, contactless applications, such as the Octopus smart card and Electronic Toll Collection by Autotoll Limited are using RFID technology to facilitate smoother, more hassle-free journeys throughout Hong Kong.

利用無線射頻識別技術來把行李分類，能減低行李遺失比率，令機場更有效率操作。同時，非接觸式的應用系統，例如八達通智能卡、快易通電子道路收費等也採用無線射頻識別技術，令旅程更順暢無阻，縱橫香港，路路暢通。

The differences between EPC-based RFID and conventional barcode systems
以無射頻識別技術為本的產品電子代碼與傳統條碼系統的分別

Characteristics 特點	EPC / RFID 產品電子代碼 / 無線射頻識別技術	Bar Code 條碼
Data transmission 數據傳送	Radio waves 無線電波	Optical 光波
Line of sight 瞄準線	No 沒有	Yes 有
No. of tags read simultaneously 同步讀取標籤數量	Multiple 多個	Only One 一個
Tag re-use 標籤循環使用	Yes 可以	No 不可以

Characteristics 特點	EPC / RFID 產品電子代碼 / 無線射頻識別技術	Bar Code 條碼
Reading speed 讀取速度	500 / minute 500 / 每分鐘 	80 / minute 80 / 每分鐘 
Moving object reading 讀取正在移動的物件	Yes 可以 	No 不可以 
Data capture mode 擷取數據方式	Automatic 自動 	Manual 人手 
Position of tag 標籤位置	Inside or outside of package 包裝內外均可 	Outside of package only 只限於包裝外 

How Supply Chain Stakeholders benefit from adopting EPC / RFID technology?

供應鏈夥伴採用產品電子代碼 / 無線射頻識別技術的獲益是甚麼?

Key Benefits 主要獲益	Suppliers 供應商	Warehousing / logistics providers 貨倉 / 物流供應商	Retailers 零售商
Inventory visibility 庫存一目了然	✓	✓	✓
Human error prevention 避免人為錯誤	✓	✓	✓
Higher operating efficiency, hence lower operating costs 高效率運作，而達至更低的營運成本	✓	✓	✓
Better inventory control, preventing out of stock and over stocking 更完善的庫存監控，避免缺貨和存貨太多	✓		✓
Increased data accuracy 增加數據準確性	✓	✓	✓
Better production planning 更完善的生產計劃	✓		
Better logistics management 更完善的物流管理	✓	✓	✓
Product flow monitoring in real time 實時監控產品流向	✓	✓	✓
Enhanced theft and counterfeiting prevention 提升防盜及偽冒產品的功效	✓	✓	✓
Speedy check out 結帳更快捷			✓
Increased customer satisfaction 增加顧客的滿足感	✓	✓	✓

How are people using RFID technology in Hong Kong?
香港如何應用無線射頻識別技術？

Autotoll's Electronic Toll Collection
快易通電子道路收費服務

Autotoll has over a decade of experience in providing Electronic Toll Collection (ETC) service. Today, the Autotoll ETC system covers all of the Hong Kong's toll roads and tunnels and automates the manual in-lane toll collection process, with full transaction records available for subscribers.

快易通擁有超過十年電子道路收費 (ETC) 的服務經驗，現時快易通的ETC系統已在香港所有主要幹線和隧道提供服務，這套系統將傳統人手收費模式改為自動化，提供準確的行車記錄。

Quick Facts EPC速覽

Can EPC tagged products be tracked once we have brought them home?
我們攜帶了附有產品電子代碼標籤的貨品回家，會否被追蹤到？

An EPC tag does not contain any personal data. It can only transmit its EPC number within a three-meter radius and its signal range is weakened once the item it is attached to is placed in a shopping bag.

產品電子代碼標籤不附任何個人資料，它只會在三米直徑圓周範圍內傳送它的產品電子代碼，而其訊號射程亦會隨物件放入購物袋後而減弱。

The Octopus smart card
八達通卡的應用

There are currently over 16 million Octopus cards in circulation in Hong Kong being used to make payments by consumers. With over 10.5 million transactions processed each day, the contactless payment system handles a staggering HK$29 billion worth of payments a year. Its applications have spread from the Mass Transit Railway network to car parks, fast food outlets, convenience stores, supermarkets, vending machines, pay phones, leisure facilities and schools.

現時全港有超過1,600萬張八達通卡於市面流通，每天處理的交易超過1,050萬宗，非觸式的付款系統每年處理達港幣290億元的驚人交易。八達通的應用範圍亦由地鐵伸展至停車場、快餐店、便利店、超級市場、自動售賣機、公眾收費電話、康樂設施以至學校。

Baggage Handling System at Hong Kong International Airport
香港國際機場的行李處理系統

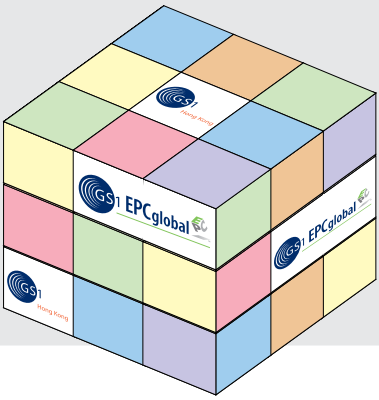
The Hong Kong International Airport has been using RFID technology in its baggage handling system since 2005. Today the RFID-powered system handles over 70,000 pieces of departures and transfer bags per day and an average of 8,000 bags per peak hour. The airport has installed over 500 RFID bag tag printers at check-in counters and more than 500 RFID antennas and readers all over the baggage handling areas, ensuring a high service standard, and a hassle-free and pleasant journey for travelers.

香港國際機場從2005年起在行李處理系統內使用無線射頻識別技術。今天這系統每日處理超過70,000件抵港和轉機的行李，平均每小時(繁忙時段)處理8,000件。機場在登記櫃位安裝了超過500部無線射頻識別行李標籤打印機，及於行李處理區域內安裝了超過500部無線射頻識別天線和閱讀器，確保為旅客帶來高水平服務、無阻礙和愉快的旅程。

What are the EPC services offered by GS1 Hong Kong?
香港貨品編碼協會提供甚麼產品電子代碼服務?

- *EPC Membership Subscription Services*
- *EPC Manager Number Registration Service*
- *EPC Training and Knowledge Transfer Services*
- *Process Improvement Consultation*
- *EPC / RFID Implementation Management*
- *System Analysis and Technology Sourcing*
- *Compliance Audit and EPC Certification*
- *EPC/ RFID Enabled Supply Chain Management Best Practices*
- *Supply Chain Innvoation Centre*

- *EPC會籍申請服務*
- *EPC管理單位代碼註冊服務*
- *EPC培訓及知識轉移服務*
- *流程改善諮詢*
- *EPC / RFID實施管理*
- *系統分析及技術採購*
- *規範審核及產品電子代碼認證*
- *EPC / RFID供應鏈管理及最佳實務守則*
- *供應鏈創科中心*



About EPCglobal Inc.
EPCglobal Inc. 簡介

EPCglobal Inc is a subsidiary of the global not-for-profit standards organization GS1, and supports the global adoption of the Electronic Product Code as industry-driven standards to enable accurate, immediate and cost-effective visibility of information throughout the supply chain. For more information about EPCglobal Inc, visit:
www.epcglobalinc.org

EPCglobal Inc. 是非牟利國際組織GS1的附屬機構，致力支援全球採納產品電子代碼作為推動行業的標準，成就準確、實時和具成本效益的供應鏈資訊透明化。如欲獲得更多有關 EPCglobal Inc. 的資料，請瀏覽：
www.epcglobalinc.org

About GS1 Hong Kong
香港貨品編碼協會簡介

Hong Kong

Founded in 1989, GS1 Hong Kong is a not-for-profit industry support organization. It is committed to enhancing Hong Kong enterprises' competitiveness through the provision of global supply chain standards, best practices and enabling technologies. As GS1's local chapter, GS1 Hong Kong is the only organization that is authorized to issue and administer GS1 identification numbers in Hong Kong. Standards and solutions offered include bar coding services, B2B e-commerce services, Global Data Synchronization (GDS) and Electronic Product Code™ / Radio Frequency Identification (EPC/RFID). The organization also hosts a wide range of training courses to facilitate knowledge transfer in supply chain management, e-business strategies, global standards and the implementation of enabling technologies. The GS1 community has over one million corporate members spanning 150 countries and economies and more than 20 industries. For more information about GS1 Hong Kong, please visit : www.gs1hk.org.

香港貨品編碼協會於一九八九年成立，是一個非牟利的工商業支援機構，致力發展全球識別貨品標準、供應鏈應用技術及提供最佳實務守則，為香港企業提高市場競爭力。香港貨品編碼協會為GS1國際組織的本地分會，是香港唯一獲認可簽發及管理GS1國際貨品編碼的機構。協會所提供的標準和解決方案包括貨品編碼及條碼服務、企業對企業電子商貿服務、全球數據同步 (GDS) ，以及產品電子代碼 / 無線射頻識別 (Electronic Product Code™ / Radio Frequency Identification)。協會亦舉辦一系列促進知識轉移的培訓課程，包括供應鏈管理原理、電子商貿策略、全球標準及如何實施應用技術。GS1在全世界各地擁有逾一百萬企業會員，遍佈全球一百五十個國家和經濟體及二十多個行業。如欲獲得更多有關香港貨品編碼協會的資料，請瀏覽：www.gs1hk.org。

Hong Kong

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