

ND4000 Series Thermal RFID Ticket Printer/Encoder

The Newbury Data 4000 range of designed & manufactured thermal ticket printers are capable of storing, printing, encoding and reading credit card sized tickets. The printers use RFID contactless smart cards enclosed in direct thermal coated paper or plastic tickets, which gives high quality print combined with ITSO compatible contactless encoding. The printer range has been developed to provide an economical solution to printing and encoding a wide range of access control, transport, event management, tourism, leisure and gaming tickets etc.



The ticket format is either portrait or landscape. Each character position is individually addressable enabling tickets to be re-printed with additional text and new encoding to be written on subsequent occasions. The ND4030 allows two different tickets stocks (paper and plastic cards) if required. This rugged range of printers is ideal for any desktop environment or can be easily integrated into almost any kiosk. Newbury Data can also offer specialised configurations of this printer range to meet customer requirements.

The Newbury Data 4000 range comprises (for Magnetic encoding see ND4020 specification sheet)

- **ND4030K** RFID Ticket Printer with internal ticket supply hopper, ticket dropped on exit
- **ND4030D** RFID Ticket Printer with internal ticket supply hopper, ticket held on exit for manual receipt
- **ND4030M** RFID Ticket Printer Mechanism with internal ticket supply hopper for kiosk operations

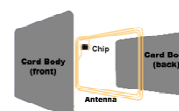
ND4030 Applications

The following is a summary of just some of the potential applications that could benefit from use the contactless smart card paper or plastic tickets. The benefit in each of these applications is the ability to print personalised details for or about the user on the ticket as well encoding any application data on the contactless smart card.

- **Bus/Coach** Travel, Event Management & e-Purchase tickets
- **Rail** Travel, Event Management & e-Purchase tickets
- **Airlines** Travel, Boarding Pass & e-Purchase tickets
- **Ferry Operators** Travel, Boarding, Cabin & e-Purchase tickets
- **Car Hire / Car Parks** Secure Parking and/or Access Control Tickets
- **Theatre Operators** Secure Entry, Access Control & e-Purchase tickets
- **Cinemas** Secure Entry, Access Control & e-Purchase tickets
- **On-line Ticketing Agents** Secure Entry, Access Control & e-Purchase tickets
- **Sports Events** Travel, Secure Entry & e-Purchase tickets
- **Access Control Systems** Access Control, Secure Entry tickets
- **Retail** Customer Collection & e-Purchase tickets
- **Gaming/Betting** Secure Entry, Access Control, Payment & e-Purchase tickets

ND4030 Specification (subject to change without notification)

Printing Method:	Direct thermal
Print Speed:	150mm /sec
Media Type:	Pre printed or plain 54mm x 85mm sized direct thermal tickets Paper laminate or thin plastic constructions.
Ticket/Card Capacity:	ND 4030 - 600 (+ 900 optional)
Ticket Format:	Portrait with 36 lines of 25 characters or landscape with 25 lines of 45 characters using two customer specified resident fonts one of which can be enlarged.
Ticket Transport:	DC Motor with encoder
Document Presentation:	Optional output tray for 50 tickets (approx.)
Approvals:	Designed to meet CE approval
Interface:	Serial 9600 to 115,200 baud.
Power Requirements:	24V dc 1.8 A max.
Weight:	ND 4030 5.5 Kg (Empty)
Case Colour:	Beige or Black
Operating Temperature:	+5 to +45 deg C
Dimensions:	ND4030 (D & K, and M without additional paper exit): 300 x 112 x 215 mm (LxWxH)



RFID – Contactless Smart Card Details

- Contactless smart card reader/writer based on CL RC632 reader IC
- Contactless operating frequency 13.56 MHz
- Supports MIFARE® and ISO 14443A/B part 1-4
- Supports MIFARE® Classic crypto
- Supports ISO 15693
- Supports Philips ICODE®
- Supported cards include - Mifare Classic, Mifare Ultralight, Mifare 4K, Mifare Pro and Pro X, JCOP 30, JCOP 31, DESFire, Sharp SJCard, SR176, ST19WR66 and many more
- Supported on Windows 98 OSR2, ME, 2000, XP, Mac OS X and Linux
- ITSO library available (optional)

ND4030 RFID Contactless Smart Card Support

The ND4030 supports a wide range of contactless cards as listed on page 2, availability for paper RFID tickets approved for the ND4030 (and available from Newbury Data) is focused on integrating the MIFARE IC. The following 2 pages give an overview of the MIFARE product range, and more specifically the Ultralight & Classic 1K IC's as recommended for use in the applications also listed on page 2. Additional information is available upon request or from www.mifare.net

About MIFARE (courtesy of www.mifare.net)

Fully compliant with ISO 14443A, MIFARE is the leading industry standard for contactless and dual interface smart card schemes. With an immense world-wide installed base, it is a proven RF communication technology for transmitting data between a card and a reader device. The platform offers a full range of compatible contactless smart card and reader ICs, as well as dual interface ICs that provide a link between the contactless and contact card markets.

MIFARE Classic covers hardwired ICs using the MIFARE communication protocol, such as the MIFARE Standard 1k and the new MIFARE Standard 4K.

MIFARE Ultralight is ideal for low-cost, high-volume limited-use tickets for public transport, event ticketing and many other application areas. It provides the perfect replacement for today's magnetic-stripe tickets.

MIFARE dual interface controllers include the MIFARE PRO and the MIFARE PROX, family. These 8-bit microcontroller ICs feature an open protocol on both contact and contactless interfaces, delivering the flexibility and security to support multiple applications on a single card IC.

MIFARE DESFire meets the increasing demands for high-speed, triple-DES (Data Encryption Standard) secured contactless ticketing. Philips' MIFARE DESFire smart cards and MIFARE DESFire SAMs in readers are ideal for public transportation, event ticketing, identity, e-government, city loyalty and e-purse schemes.

MIFARE Reader Components include reader ICs, reader modules and evaluation kits conforming to a range of 13.56 MHz contactless standards such as ISO 14443A & B and ISO 15693.

Applications

The key application for the MIFARE Interface Platform is electronic ticketing in public transport. Travellers just wave their card over a reader at the turnstiles or entry, benefiting from improved convenience and speed in the ticketing process. MIFARE products are set to be the key to individual mobility in the future, supporting multiple applications including road tolling, airline tickets, access control and many more.

Customer Benefits

- MIFARE is the leading industry standard for contactless smart card transactions
- World-wide largest installed base
 - more than 5 million MIFARE reader core components sold
 - more than 500 million contactless and dual interface ICs sold
- Fully compliant to ISO14443A
- Future-proof evolution path and roadmap
 - Standard interface ensures that today's infrastructure can easily be upgraded for future card ICs
- Consistent product portfolio and multiple sourcing at all levels of the value chain

An open platform

MIFARE is an open platform, available to any company willing to develop, market and sell MIFARE-compatible products under conditions of common industry practice. Companies supporting MIFARE throughout the full value chain of the various applications (service providers, system integrators, card and reader manufacturers, software companies) can make use of extensive support services:

- MIFARE compatibility certification by the independent MIFARE Certification Institute (MCI) Test-house Arsenal, which ensures that certified cards and readers from any supplier work together properly.
- MIFARE Book of Partners - a regularly updated listing of the companies offering MIFARE products and services.
- mifare.net - a forum to drive and support the development of the MIFARE interface platform for all companies and institutions involved in MIFARE. The website contains all you need to know about the advantages of MIFARE, plus information about security and standardisation. There is also a global overview of where MIFARE is being successfully used around the world. Newbury Data is also listed on mifare.net

MIFARE Ultralight (courtesy of www.mifare.net)

Tickets based on Philips MIFARE Ultralight ICs can act as single trip tickets in public transportation networks, loyalty cards or even day passes at big events. They are the ideal replacement for conventional ticketing solutions such as paper tickets, magnetic-stripe tickets or coins. As the usage of contactless proximity smart cards becomes more and more common, transport operators are beginning to switch to completely contactless solutions. The introduction of the new contactless MIFARE Ultralight IC for limited-use tickets will lead to a reduction of system installation and maintenance costs. Terminals will be less vulnerable to damages and mechanical failures caused by ticket jams. MIFARE Ultralight can easily be integrated into existing schemes and even standard paper ticket vending equipment can be upgraded. In addition, this solution for low cost tickets helps transport operators to reduce fraud and the circulation of cash within the system.

As frequent travellers and commuters normally use a high end contactless smart card (e.g.: based on MIFARE DESFire) for their regular trips, MIFARE Ultralight enables occasional travellers to benefit from the same advantages. It significantly improves boarding times and helps to experience quicker travel and easier movement between buses, trains and other means of transportation. The mechanical and electrical specifications of MIFARE Ultralight are tailored to meet the requirements of paper ticket manufacturers. Issuing smart paper tickets based on MIFARE Ultralight only requires a minor upgrade to standard Edmonson / Eurosize ticket vending terminals.

This can be achieved by fitting a simple contactless reader for ticket initialisation. MIFARE Ultralight operates according to the ISO 14443A standard. Meaning cards or tickets based on MIFARE Ultralight can be used at a distance of up to 10 cm with true anti-collision properties and without the need for a battery. Last but not least, MIFARE Ultralight is fully compatible with all existing MIFARE infrastructures and can therefore be easily integrated in current transportation schemes.

Key applications

- Limited-use tickets in public transport (e.g.: single trip tickets, multiple trip tickets, tourist weekend passes)
- Event ticketing (stadiums, exhibitions, leisure parks, etc.)

Key features

- 100% compatible with existing MIFARE infrastructure
- Real anti-collision supported
- Operating distance up to 10 cm
- 106 kbits/s data transfer rate
- Unique 7 byte serial number (ISO 14443A, cascade level 2)
- High data integrity – 16 bit CRC, parity per byte, bit coding, bit count check
- 512 bit EEPROM, organised in 16 pages of 4 bytes
- 32 bit one-time programmable (OTP) area
- 384 bit read / write area for user data
- Field programmable 'Read only' locking function per page
- DESFire SAM based security methods supported

MIFARE Classic - Standard 1k (courtesy of www.mifare.net)

MIFARE Standard 1k was the first IC to be used in high volume public transport ticketing in a major transport project in Seoul, Korea. Continuing this success, cities such as London, Beijing, Taipei, Pusan and many more are adopting MIFARE as the contactless interface platform for the present and future. MIFARE Standard 1k is primarily used in closed systems, where value is extracted in a secure and authorised way from the card by the service provider, or for fixed value tickets (e.g. weekly or monthly travel passes). Another important application is physical access control. Here MIFARE Standard 1k cards are widely used for ID cards, employee cards and company or building access – for example, to provide postmen with access to apartment blocks to deliver mail.

Key applications

- Public transportation
- Access control
- Event ticketing
- Gaming
- Identity

Key features

- 1 kbyte EEPROM (768 Byte free available)
- Unique serial number (4 Byte)
- 16 securely separated sectors supporting multi-application
- Each sector consists 4 blocks with a length of 16 Byte
- 2 x 48 bit keys per sector for key hierarchy
- Access conditions free configurable based on 2 level key hierarchy
- Number of single write operations: 100.000
- Data retention: 10 years

ND4030 Kiosk

The ND4030 Kiosk is designed for internet booking ticket collections on covered station platforms or office working environments, with the capability of holding up to 3 x ND4030 desktop printers to support high capacity ticket distribution environments.

Outline Specification

- Robust Metal Cabinet with 17" TFT Display
- Rugged 85 Key, IP65 Keyboard and Trackball Mouse and (or) Touch screen for Users
- Up to 3 ND4030 Ticket Printers can be installed to give a high ticket capacity
- Tickets are dropped into a ticket bowl with Perspex door
- Uses a standard PC for ease of maintenance and upgradeability
- PC Specification depends on application
- Upper and lower doors are separately locked, allowing the PC to kept locked away from the staff who routinely replenish the tickets.
- Other configurations possible



Kiosk Specification (Business to Business Applications)

Keyboard Stainless Steel GIKV 1211 Keyboard with trackball mouse

Touch Screen 17ins Resistive Touch Screen in toughened glass

Monitor 17ins TFT Monitor

PC AMD Sempron 2800 Processor
 256MB DDR 400 Memory
 80 GB ATA Hard Drive
 16X DVD Rom Drive
 Fast 100 Mbit Ethernet LAN

Op System Windows XP Professional Edition

Ticket Printer Upto 3 x ND4030K

Kiosk The kiosk complies with disability access requirements
 The kiosk is free standing with secure access to the ticket loading area, and secure access to the PC and other components
 The kiosk is fitted with a 13 amp fused mains cable and a wired network connection point
 Finish - the kiosk will be painted in the customers defined livery

- Overall Height 1415 mm
- Overall Width 647 mm
- Overall Depth 462mm