

# HID ... Making MIFARE Better!

access control

**HID Proximity and MIFARE Card (1431)**  
Using proximity for access control? Need cashless vending? Photo ID required? With HID, one card does it all!

transit/fare collection

**HID MIFARE Card (1430)**  
Need an HID proximity format on a read/write MIFARE card? No problem with MIFARE from HID!

cashless vending



**HID MIFARE Reader/Writer (6055B)**  
Wiegand and RS-232 output makes any installation a snap!



**EVEN BETTER**  
Embed these cards with a contact smart chip module. Complete your credential by personalizing with a photo ID.

# HID MIFARE® PRODUCTS OVERVIEW

## What is MIFARE?

MIFARE is a contactless memory card technology that operates at the 13.56 MHz operating frequency. Initially developed by Philips Electronics for use in the transit and cashless vending markets, MIFARE offers read/write capability in a contactless form factor. MIFARE provides a unique 32-bit serial number for each card. A short read range maintains the integrity of the read/write process required by transit and cashless vending applications.

## Why choose HID MIFARE?

To simplify use in access control applications, HID's MIFARE reader/writer offers a Wiegand output to support easy connection to standard access control systems. In addition, HID can program a standard HID proximity format into a sector of the MIFARE card. Use proximity or MIFARE and store just one record for each cardholder in the database. HID's technical leadership in RFID and multi-technology credentials allows you to experience the benefits of advanced card technology, while leveraging the capabilities of your current systems.

## What can I use it for?

Today, MIFARE technology is primarily used for e-purse applications such as vending, fare collection, transit, airline ticketing, prepaid metering, phone cards, and toll roads. Data applications include ID cards, university cards, loyalty programs, and medical information cards. MIFARE cards can manage up to 16 separate applications on just one card!

## Proximity or MIFARE for access control?

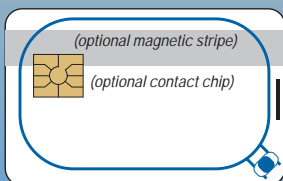
Both proximity (125 kHz) and MIFARE (13.56 MHz) use contactless technology. If you are currently using MIFARE for other applications, extend the use of your MIFARE card to include contactless access control. Use proximity for access control and other applications not requiring read/write capabilities. When you simply need to read the card serial number, proximity provides superior read-ranges, compatibility with most access control systems, and a larger selection of readers and cards. Overall, proximity is a lower cost contactless solution for access control. To learn more about the differences between proximity and MIFARE, download our white paper at: [www.HIDcorp.com/mifare](http://www.HIDcorp.com/mifare).

## HID MIFARE CREDENTIALS

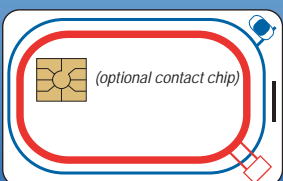
Are you currently using proximity or magnetic stripe based systems? If so, maximize the use of your proximity or magnetic stripe card by adding MIFARE contactless memory card technology for other applications. No matter what your needs are, HID can manufacture a custom multi-technology credential.

### Features

- 13.56 MHz operating frequency provides high-speed, reliable communications with high data integrity.
- When used with the HID MIFARE reader/writer, the MIFARE card provides up to 1.5" (3.75 cm) read-range.
- Supports all HID proximity card formats, including Corporate 1000.
- Meets ISO standards for thickness; use with all direct image and thermal transfer printers.



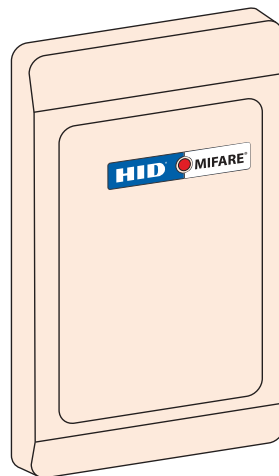
**HID MIFARE Card (1430):** showing MIFARE antenna and module (blue), optional magnetic stripe (gray), and optional contact smart chip module (gold). The vertical slot punch location is shown on the right.



**HID Proximity and MIFARE Card (1431):** showing MIFARE antenna and module (blue), proximity antenna and module (red), and optional contact smart chip module (gold). The vertical slot punch location is shown on the right.

## HID MIFARE READER/WRITER 6055B

Use the Wiegand output format to easily integrate the reader/writer into standard access control systems. For other applications, an integral RS-232 output allows for connection to PCs or dedicated microcontrollers. When combined with an HID MIFARE credential, you have a powerful multi-application solution.



### Features

- The HID MIFARE Reader/Writer has two communication ports:
  - 1) **Wiegand** for connection to standard access control panels.
  - 2) **RS-232** for connection to PC's or dedicated microcontrollers.
- The HID MIFARE Reader/Writer has two operational modes:
  - 1) **Security** (outputs Wiegand data, also echoed on the RS-232 port).
  - 2) **Transaction** (externally controlled via the RS-232 port).
- Potted electronics protect against harsh weather and vandalism.
- Easy installation with mounting on standard U.S. size single-gang electrical switchbox.
- ISO 14443 Type A compliant.

### DID YOU KNOW?

Learn more about HID's complete line of contactless reader and credential solutions in HID's Reference Guides.



# PRODUCT SPECIFICATIONS AND FEATURES

## 6055B MIFARE Reader/Writer Features

**Mounting:** Mounts on a standard US single-gang electrical switchbox for easy installation. Mounts directly on metal with minimal impact on read range performance. Included 9' (2.7m) pigtail wiring simplifies installation.

**Audiovisual Indication:** A red LED flashes green and the beeper sounds when reader is presented with an HID MIFARE® card. The multicolored LED and beeper can also be controlled individually by the host system.

**Diagnostics:** On reader power-up, an internal self-test routine checks and verifies the setup configuration, determines the internal or external control of the LED and beeper, and initializes reader operation.

**Indoor/Outdoor design:** Sealed in a rugged, weatherized polycarbonate enclosure designed to withstand harsh environments, providing reliable performance and a high degree of vandal resistance.

**Easily interfaced:** The Wiegand output interfaces with all existing Wiegand protocol access control systems. In Security Mode, the RS-232 port echoes the Wiegand output, sending data in hexadecimal format. In Transaction Mode, the RS-232 port interfaces with personal computers or dedicated microcontrollers using bidirectional serial communications and the HID communications protocol.

### Card Compatibility:

1430 HID MIFARE cards (HID-encoded MIFARE cards).

1431 HID Proximity and MIFARE Cards (dual technology: MIFARE and HID 125 kHz proximity).

Any MIFARE card using the Philips S50 Chip or equivalent (ISO 14443, Type A). If an existing card is secured with custom keys, user must know the key that secures the desired sector(s).

**Security:** 48-bit read and write keys are extremely secure. Unique key pairs may be defined for each sector. Readers and cards must have matching keys. All RF data transmission between the card and reader is encrypted.

**Warranty:** Warranted against defects in materials and workmanship for life from date of shipment. See complete warranty policy for details.

### Part Numbers

Base Part Number: 6055B Wiegand and RS-232 Interface

Description: Tri-state LED, Internal Beeper On

Options:

- color: (gray, beige, black, white)
- LED and beeper operation
- card read mode
- card serial number output mode
- custom label

(Please see HID "How to Order Guide" for a specific description of the options and associated part numbers.)

## 6055B MIFARE Reader/Writer Specifications

**Typical maximum\* read range:** 1.5" (3.75 cm)

\*Dependent on local installation conditions.

**Dimensions:** 4.70" x 3.00" x 0.68" (11.9 x 7.6 x 1.7 cm)

**Material:** Polycarbonate UL 94

**Power supply:** Voltage: 9-14 VDC (16 VDC maximum)

**Current:** 100mA @ 12 VDC. Linear power supply recommended.

**Operating temperature:** -22° to 150° F (-30° to 65° C)

**Operating humidity:** 0-95% relative humidity non-condensing

**Weight:** 3.3 oz. (94 gm)

**Transmit frequency:** 13.56 MHz

**Certifications:**

UL 294/cUL, FCC Certification- United States, Canada Certification,

CE Mark- Europe, Australia C-Tick, New Zealand EMC

**Termination:** 9' (2.7m) pigtail

**Cable distance:**

Wiegand interface: 500 feet (150 m)

RS-232 interface: 50 feet (15 m)

Recommended cable is ALPHA 1299 C (22 AWG)

9 conductor minimum stranded with overall shield or equivalent. Additional conductors may be required for connection of all outputs.

## HID MIFARE Card - 1430

## HID Proximity and MIFARE Card - 1431

### Read/Write Functionality for MIFARE Multifunctional Memory

**Applications:** Sixteen securely separated files (sectors), each protected by a set of two keys and programmable access conditions, allow complex applications and provide for future expansion. Each sector potentially represents a different application. Different keys can protect read/write operations in order to build key hierarchies in the system. Security mechanisms such as mutual authentication and encryption are efficiently combined with fast processing and data communication, resulting in transaction times of less than 100 milliseconds for a typical secure ticketing transaction.

**Proven, Reliable Technology:** Offers extremely consistent read range. Unaffected by body shielding or variable environmental conditions, even when close to keys and coins.

**Thin:** Can be carried with credit cards in a wallet or purse. Use with a strap and clip as a photo ID badge.

**Photo ID Compatible:** Print directly to the card with a direct image or thermal transfer printer. Slot punch vertically for easy use. Note that some printing processes can affect the thickness of the cards, taking them out of ISO 7816 compliance.

**Long Life:** Passive, no-battery design allows for an infinite number of reads of the permanent, unique 32-bit serial number.

**Durability:** Strong, flexible and resistant to cracking and breaking.

### Options:

- Magnetic stripe (standard is 3 track 4000 Oersted high coercivity); please consult factory in regard to magnetic stripe options on 1431.
- External card numbering (inkjet or laser engraving)
- Vertical slot punch
- Custom artwork (text or graphics)
- Gloss finish standard
- Contact smart chip module

(Please see HID "How to Order Guide" for a specific description of the options and associated part numbers.)

[www.HIDCorp.com/mifare](http://www.HIDCorp.com/mifare)

## 1430 and 1431 Card Specifications

### (13.56 MHz MIFARE module)

#### Typical Maximum\* MIFARE Read Range

Up to 1.5" (3.75 cm) with HID MIFARE reader; cards can achieve up to 3.9" (10 cm) with other hardware, dependent on local installation conditions.

**RF Interface:** As suggested by ISO/IEC 14443, Type A

**Transaction Time:** <100 ms typical **Baud Rate:** 106 Kbaud

**Memory Size:** 1 Kbyte **Memory Type:** EEPROM, read/write

**Multi-application Memory:** 16 sectors **Fixed Serial Number:** Unique, 32 bit

**Write Endurance:** Min. 100,000 cycles **Data Retention:** 10 years

**Format Range:** up to 84 bits, including HID Corporate 1000

**Card Dimensions:** 2.127" x 3.380" x 0.033" max. (5.40 x 8.57 x 0.081 cm)

**Card Construction:** Thin, flexible polyvinyl chloride (PVC) laminate

**Operating Temperature:** -13° to 158° F (-25° to 70° C)

**Operating Humidity:** 5-95% (non condensing) **Weight:** 0.24 oz. (6.8 g)

**Specification Compliance:** ISO 7810, ISO 7816, ISO 14443, Type A

**Warranty:** Conditional one-year warranty. See complete warranty policy for details.

## Additional 1431 Card Specifications

### (125 kHz Proximity Module)

#### Typical Maximum\* Proximity Read Range

MiniProx® reader-up to 5" (12.5 cm)

ThinLine II® reader-up to 5" (12.5 cm)

Prox80™ reader-up to 5" (12.5 cm)

ProxPoint® Plus reader-up to 2.5" (6.25 cm)

ProxPro® reader-up to 7" (17.5 cm)

ProxPro® II reader-up to 8" (20 cm)

MaxiProx® reader-up to 20" (50 cm)

\*Dependent on local installation conditions.

# TOOLS for MIFARE DEVELOPMENT and SUPPORT

HID offers several kits that extend the utility of the MIFARE product line. The kits shown below feature a 6055B HID MIFARE reader as the central component, and come packaged with software, cables, documentation and test cards.

## MIFARE Demo Kit

**Demonstrates the capabilities of the HID MIFARE reader and MIFARE cards**

Base Part Number 3013



The HID MIFARE Demo Kit demonstrates the capabilities of MIFARE contactless memory cards when used with the Model 6055B HID MIFARE Reader. Users can demonstrate that the HID MIFARE reader is capable of much more than access control when used with the appropriate software.

The Demo Kit software features examples of popular smart card applications including access control, personalization, and cashless vending. The simple graphics and interactive user interface allow users to quickly demonstrate MIFARE technology.

The demo kit includes a 6055B reader/writer\* with desktop stand, CD-ROM containing demonstration software and documentation, universal power supply, serial cable and sample cards.

Demo software available in English, Spanish, French and German.

MIFARE is a registered trademark of Philips Electronics, N.V.

Microsoft and Windows are registered trademarks of Microsoft Corporation.

Pentium is a registered trademark of Intel Corporation.

## MIFARE Developers

### Resource Kit

**Application Development Tools for use with the HID MIFARE Reader**

Base Part Number: 3012



The HID MIFARE Developers Resource Kit (DRK) provides professional software engineers with the tools required for writing and testing software applications for the Model 6055B HID MIFARE Reader. When you purchase a DRK, HID's Engineering Support Team is available to answer development-related questions.

The DRK includes a 6055B reader/writer\* with desktop stand, CD-ROM containing demonstration and development software and protocol documentation, universal power supply, serial cable and sample cards.

## MIFARE Card Programmer

**Programs Proximity Format Access Control Data into HID MIFARE Cards**

Base Part Number: 3011



The HID MIFARE Card Programmer allows HID proximity formats to be programmed onsite into a sector of new or existing MIFARE cards. Access control capability can also be added to MIFARE cards containing other applications. To insure security of your format and cards, a MIFARE Card Programmer license is required.

The Card Programmer includes a 6055B reader/writer\* with desktop stand, CD-ROM containing programming software and documentation, personalization diskette, universal power supply, and serial cable. Consult factory for availability.

### SPECIFICATIONS FOR KIT ACCESSORIES

Stand Dimensions: 6.25" H x 4.3" D x 5" W  
(158 cm x 109 cm x 127 cm)  
Weight of reader and stand): 10.4 oz (295 g)

Material: Stand - Black PVC  
Reader housing - Polycarbonate UL 94  
\*Firmware modified from standard reader

#### ALL KITS REQUIRE A PC WITH:

- Pentium 166 MHz or better
- Windows 9X, 2000, or NT4+
- 50 MB of available disk space
- 32 MB RAM
- Available serial COM port

Power Supply:  
Input: 90-264VAC 50/60 Hz, US Plug  
Output: 12VDC, Connector: 0.0219", Shell: +  
Current Draw: 100mA @ 12VDC  
Environmental:  
0° to +35°C (32° to 95°F)  
10 - 80% RH, non-condensing  
US Plug: IEC-320-C13 compatible cordset  
may be easily changed to meet local standards

For more detailed information on these MIFARE tools, please see the HID website at <http://www.HIDCorp.com/mifare>.

[www.HIDCorp.com](http://www.HIDCorp.com)



**HID CORPORATION  
ASIA PACIFIC  
HEADQUARTERS**  
19/F 625 King's Road  
North Point, Island East  
Hong Kong  
Tel: (852) 2530-9907  
Fax: (852) 2530-9975

**HID CORPORATION  
CORPORATE  
HEADQUARTERS**  
9292 Jeronimo Road  
Irvine, CA 92618-1905  
U.S.A.  
Tel: +1 (949) 598-1600  
Fax: +1 (949) 598-1690

**HID CORPORATION  
LATIN AMERICAN  
HEADQUARTERS**  
Avda. Córdoba 6044  
Buenos Aires, C1427BZN  
Argentina  
Tel: +54 11 4772 5851  
Fax: +54 11 4777 6491

**HID CORPORATION, LTD.  
EUROPEAN  
HEADQUARTERS**  
Homefield Road  
Haverhill, Suffolk  
CB9 8QP England  
Tel: +44 (0) 1440 714 850  
Fax: +44 (0) 1440 714 840



An ASSA ABLOY Group company

**ASSA ABLOY**

Printed in the U.S.A.

Specifications subject to change without notice.

MRG-EN-US, Rev. 10-02, ©2002 HID Corporation