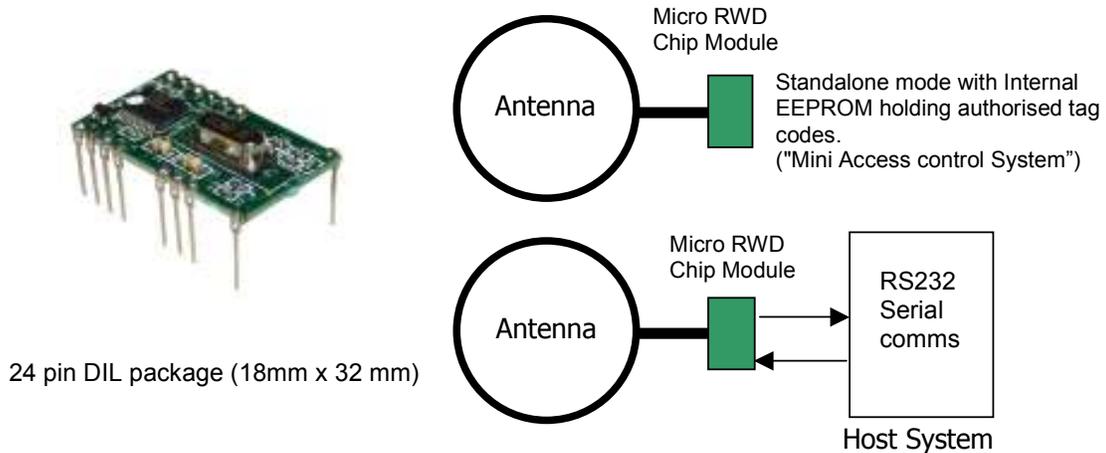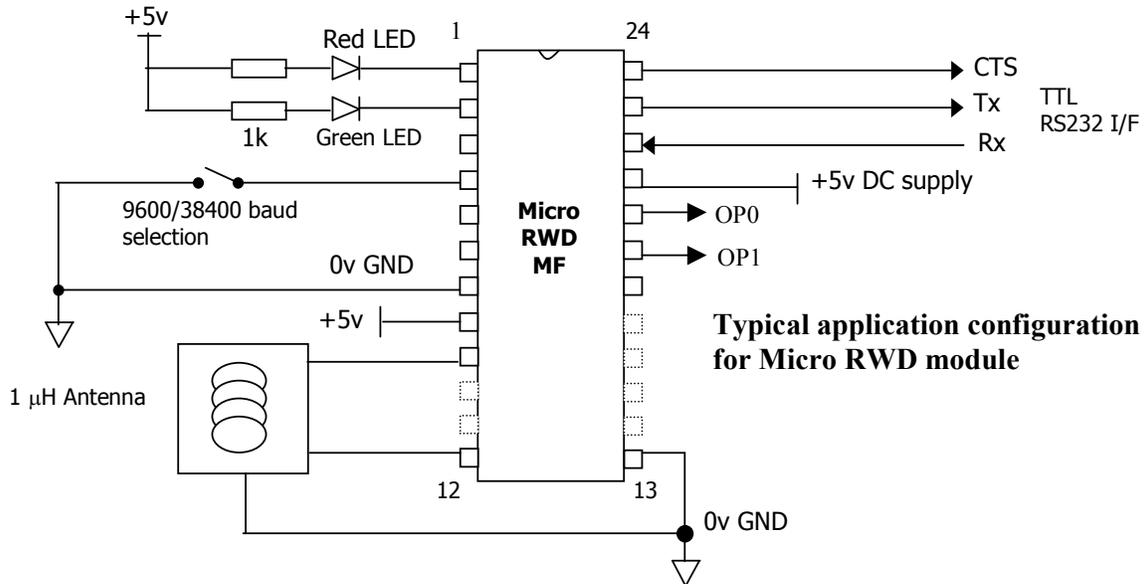# ib technology

Micro RWD MF (Mifare) ISO14443A Reader Module

(Supports: Mifare 1K, Mifare 4K and Ultralight RF Transponders)

The Micro RWD MF chip module is a complete 13.56MHz ISO14443A RF transponder / Smart card read/write system on a single chip and represents one of the smallest and lowest cost solutions available.

Micro RWD
Chip Module

Antenna

Standalone mode with Internal EEPROM holding authorised tag codes.
("Mini Access control System")

Micro RWD
Chip Module

Antenna

RS232
Serial
comms

Host System

24 pin DIL package (18mm x 32 mm)

In response to the worldwide demand for contactless smart card payment systems, the MicroRWD MF supports the market leading 13.56MHz multi-application Mifare Classic 1 Kbyte, 4 Kbyte and Ultralight cards. The RWD chip module uses hybrid mixed signal ASIC and RISC processor technology to achieve features and performance for a fraction of the cost of existing systems and is entirely encapsulated within a 24 pin DIL package (18 mm x 32 mm). The module only requires an antenna and a 5v DC supply to be a fully featured ISO14443A Mifare read/write system. In addition the MicroRWD MF module is PIN and HOST COMMAND compatible with the 125kHz MicroRWD (Hitag/EM) modules.

+5v

Red LED

1

24

CTS

Tx

TTL
RS232 I/F

1k   Green LED

Rx

9600/38400 baud selection

+5v DC supply

**Micro
RWD
MF**

OP0

0v GND

OP1

+5v

**Typical application configuration
for Micro RWD module**

1 µH Antenna

12   13

0v GND

Mifare cards have significantly more memory than most other cards and the 13.56MHz carrier frequency provides fast transaction times (106 kbaud). The cards are available with 64 bytes (Mifare Ultralight), 1024 bytes (Mifare 1K) and 4096 bytes (Mifare 4K) of EEPROM memory.
The 1k and 4k byte card memory is made up of 16 byte blocks organised as 16 or 32 sectors.

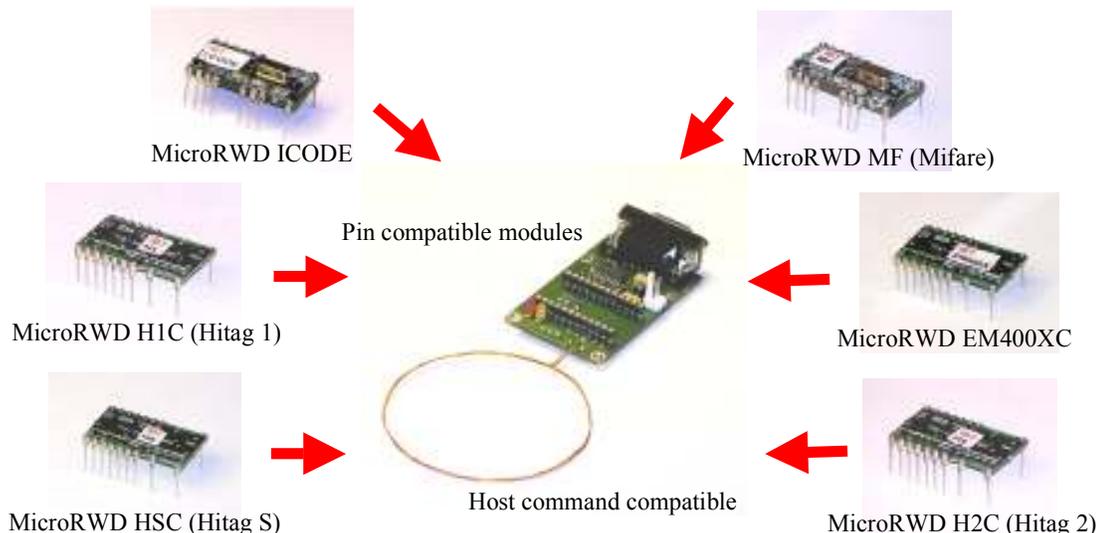MIFARE, ICODE and HITAG are registered trademarks of Philips Semiconductors N.V

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Each sector on the card can be separately locked/unlocked for access using security keys. Initial communication with the cards can also only proceed after mutual authentication between the card and the reader has succeeded (as defined by ISO14443A standard). Combined with the security key access control for the memory sectors and encrypted data streams, the Mifare cards are ideally suited to Electronic-Purse applications such as ticketing, vending and payment transactions where each sector can hold entirely separate data for different applications. Outside of these markets the large memory sizes, fast transaction times and high security means that Mifare cards can be used for almost any application.

The MicroRWD MF is a proximity system and a read/write range of up to 10cm can be achieved using the appropriate antenna. A burst RF technique is used to dramatically reduce the modules average power consumption and further enhance security. The module has internal EEPROM for holding security keys (for card authentication) and storing lists of card serial numbers that can be used as a separate authorisation procedure allowing the MicroRWD to be operated in a stand-alone mode as a "Mini Access Control System". The module also provides direct LED drives for visual indication of card acceptance and a 9600/38400 baud (selectable) TTL level RS232 interface for simple host communication. Basic commands such as "R" to read and "W" to write data allow the easy development of host controller software. In addition two high-current output signals are available for driving external loads or for custom interfaces such as Wiegand or Clock and Data protocols.

Easy to use evaluation kits are available to allow rapid evaluation of the MicroRWD's powerful features and the Mifare cards, with Windows application software, data sheets and application notes for quick-time-to-market development.

The MicroRWD MF module has been designed for a wide range of applications and the architecture uses robust software and extensive self-testing, filtering and noise rejection techniques. The module pin configuration and package has been designed to support the "Universal Socket Concept". It is pin and host command compatible with the other MicroRWD modules (125kHz Hitag/EM family) allowing the easy migration between different RFID transponder technologies with the minimum of design effort.

MicroRWD ICODE

MicroRWD MF (Mifare)

Pin compatible modules

MicroRWD H1C (Hitag 1)

MicroRWD EM400XC

MicroRWD HSC (Hitag S)

Host command compatible

MicroRWD H2C (Hitag 2)

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