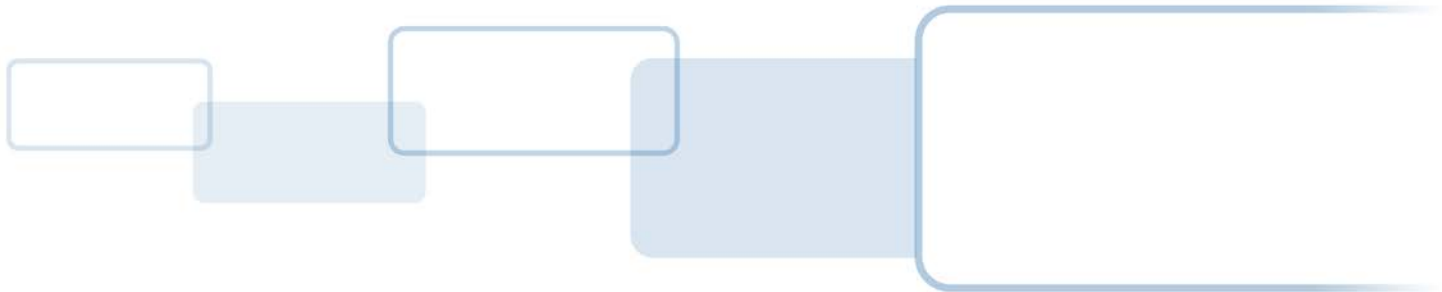




15370 Barranca Parkway
Irvine, CA 92618-2215
USA



Embedded and Logical Access Readers

MIFARE Classic™, MIFARE Plus™ and MIFARE SmartMX™

4 BYTE AND 7 BYTE UID

APPLICATION NOTE

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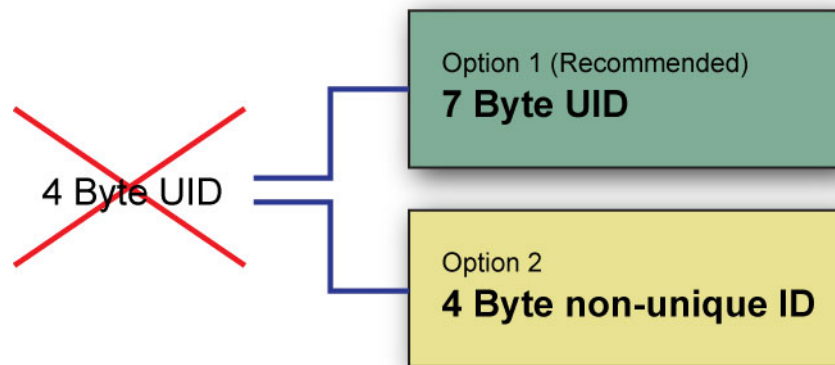
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1 Introduction

In Q2 2010 NXP® informed customers of important updates for the IDs of NXP MIFARE Classic™ and related products.



MIFARE Classic is a widely used contactless smart card invented in 1994 and first used in a public transport fare collection systems in 1996. Up until now, MIFARE Classic ICs have featured a unique identifier (UID) with a length of 4 Bytes. With the accumulated and estimated global demand of MIFARE Classic ICs, it is expected that the market will run out of 4 Byte unique IDs by the end of 2010.

This also affects the availability of 4 Byte UIDs for MIFARE Classic implementations of NXP and licensees on dual interface ICs, contactless SIMs and secure elements.

Recognizing the uniqueness of IDs is an important element of contactless system designs. Therefore, implementing precautions are necessary for non-unique IDs in automatic fare collection, closed loop payment and access management applications with respect to the following.

- Back office reconciliation
- Blacklisting of cards
- Card access right management

2 FAQ

Q What is a unique identifier number and how is it used?

A ISO/IEC 14443 Type A defines a Unique Identifier used for card selection and activation. The standard defines single, double and triple size UIDs that consist of 4, 7 and 10 Byte. In many contactless systems, the UID is used for card activation and logical reference (that is, in a background system to the card).

Q Are only MIFARE Classic 1K products affected?

A No, the 4 Byte UID issue affects all ISO/IEC 14443 Type A products including MIFARE Classic products (MIFARE Classic 1k and MIFARE Classic 4k), MIFARE Plus (4 Byte version) as well as all MIFARE Classic implementations on NXP's SmartMX and JCOP products. The 4 Byte UID issue also affects Infineon Technologies® and NXP® MIFARE® licensees.

Q Are MIFARE Ultralight, Ultralight C, DESFire, DESFire EV1 and Plus (7 Byte UID version) ICs also affected by the 4 Byte UID issue?

A No, these contactless NXP ICs have 7 Byte UIDs and are not affected by the depletion of the 4 Byte UIDs.

Q What do non-unique UIDs mean for the legacy infrastructure?

A For the infrastructure, there is no impact as the non-unique UID is still 4 Byte with respect to the full system. Possibly, cards using non-unique UIDs introduce duplicates into the back-end system and therefore cause problems regarding black listing, fare calculation and card lifecycle management.

Q Are non-unique UIDs usable, since uniqueness is important?

A Yes, uniqueness is an important part of a contactless system (for example, with respect to fare calculation, black listing); therefore, NXP recommends going to a 7 Byte UID. However, it is not necessary for legacy infrastructure to completely migrate to 7 Byte UIDs before the market runs out of the unique 4 Byte UIDs. Therefore, some customers need to use 4 Byte non-unique IDs during this migration period with the according workarounds.

Q Are there any differences between a 4 Byte UID MIFARE Classic and a 7 Byte UID MIFARE Classic beyond the card activation (Anti-collision)?

A Yes, there can be differences on the system side e.g. in back office databases. See the NXP Application Note, [MIFARE and handling of UIDs](#) for differences.

Q Which HID reading devices are capable of utilizing the 7 Byte UID?

A Full details of HID readers capable of handling the 7 Byte UID are provided in the HID Reading Devices and 7 Byte UID Support section. In addition, information is provided for the HID readers that currently are unable to support the 7 Byte UID.

Q What happens if a 7 Byte UID credential is presented to a reader that only supports 4 Byte UID Credentials?

A The reader fails authentication if a credential with a 7 Byte UID is presented. Therefore, do not use 7 Byte UID credentials on readers supporting 4 Byte UID's only.

Q How are OMNIKEY® Logical Access Control readers affected?

A All contactless OMNIKEY readers are transparent readers and have been capable of handling 7 Byte UIDs since initial released. Therefore, this change does not affect any OMNIKEY reader.

3 HID Reading Devices and 7 Byte UID Support

3.1 Embedded and Logical Access Control Readers

Reader Line	Description	Model / Part Numbers	F/W Version	MIFARE Classic Full 7 Byte UID Support	Notes
Multi-ISO	Reader Core, Reader Board and Desktop Reader	0701800159-1 0701800160 0701800044-1 0701800100	V1.2 and earlier	No	V1.2.5 F/W Release Q2 2011
MIFARE-Easy	Reader Core & Reader Boards	0701800133-1 0701800029 0701800085	V1.0 and earlier	No	V1.1 F/W Release Q3 2011
Dual-ISO	Reader Core & Reader Boards	0701800134-1 0701800083 0705130805	V2.3 and earlier	No	No update planned
identiCLASS®	Reader Core, Reader Board & Enhanced Reader Board	DG3300A00 DG3500A00 DG3700A00	5.20 and later	Yes	
veriCLASS®	Reader Core, Reader Board & Enhanced Reader Board	VP3300A00 VP3500A00 VP3700A00	N/A	Yes	
OMNIKEY®	All contactless readers (include housed readers & reader boards)	All except CLi (iCLASS® only)	5.10 and later	Yes	
OEM50	Embedded Reader Module			No	Not supported for new integrations
OEM75	Embedded Reader Module	All		Yes	
OEM150	Embedded Reader Module	All		Yes	