

# Why Type B is gaining shares... (and why this is not important to the users)

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## Introduction

Contactless smart cards/tags are being deployed in many places, for many applications, to facilitate people mobility and help making the world a safer place.

The ISO 14443 standard has setup the basis for interoperable and multi sources equipments for contactless cards and readers.

This standard includes two protocols named Type A and Type B:

- Type A was designed by a manufacturer (Philips) for simple memory card applications.
- Type B was designed by a group of manufacturers and users for microcontroller smartcards applications.

To ensure interoperability, while an ISO14443 compliant card may choose to be A or B, a reader must support both types.

Recently, probably because of the market share gains of Type B, a campaign against the Type B has been launched, with many dubious arguments and some falsehood

The reality is that almost all card manufacturers support the Type B:

Manufacturer	Products	RF Standard			
		ISO 14443			Other
		A	B	A+B	-
Atmel	AT05SC			X	
Fujitsu	MB89R076, HiFerron		X		
Infineon	SLE 66CL			X	Felica
NEC	70K0S		X		
NTT	Elwise		X		
Philips	Mifare ProX, SmartMx	X			Mifare
Renesas	AE45X		X		Felica
Samsung	S3C89, S3C89K8		X	X	
Sharp	32 bit microcontrollers		X		
Sony	Felica				Felica
STMicroelectronics	ST16R, ST19		X		
Texas Instruments	(announced)		X		

*Microprocessor smartcard chip manufacturers  
(March 2005)*

See also the independent American Public Transit Association (APTA) document *Trends in Electronic Fare Media Technology*, Table 5.01, which contains a similar analysis.

## Market

The installed base of products is mainly "Mifare 1" components, which are not ISO14443 part 4 compliant, and which use a proprietary cryptographic scheme controlled by Philips. The contactless microcontroller market is composed mainly of Type B components, deployed and in

use in large scale systems. For example in the main transit networks of France, Italy and Portugal (Paris, Lyon, Lisbon, Porto, Milan...).

## Patents

The wildest fantasies have been spread on the Type B licensing policy.

Whereas the patents related to Type A are licensed by the main Type A chip manufacturer who is also the main competitor to any other manufacturer, the Type B patents are licensed by a group of users under the coordination of Innovatron, an independent company which does not manufacture or sells equipment, and which therefore ensures real fair and non discriminatory conditions for all.

The cost of the Type B patent license initial fee starts at 10.000 euros and royalties may be as low as 1.5% of the component cost, without any minimum (the licensing conditions are publicly available at <http://www.innovatron.fr>).

The type A and the type B licenses are only relevant to the chip manufacturers.

Integrators, users, central systems are not concerned by these licenses and do not have to pay anything for using the technologies.

## Technical Issues

The Type A has many technical weaknesses. For example, technical amendments have been proposed to the ISO : in order to try reaching higher speeds with Type A, the signal modulation is modified toward the Type B modulation (modulation of 60%, see the document *ISO/IEC 14443-2:2001/FPDAM 2* of 17/03/2004).

Many manufacturers have endorsed the type B as technologically better than the type A (See for example Samsung *Microcontroller based Contactless Card IC*).

Finally, the simple fact that most microcontroller manufacturers have chosen the Type B speaks for itself...

## Conclusion

The Type B / Type A debate is quite sterile as both have their advantages and shortcomings.

Thanks to the interoperability ensured by the ISO 14443 standard, this is anyway largely irrelevant to the users.

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