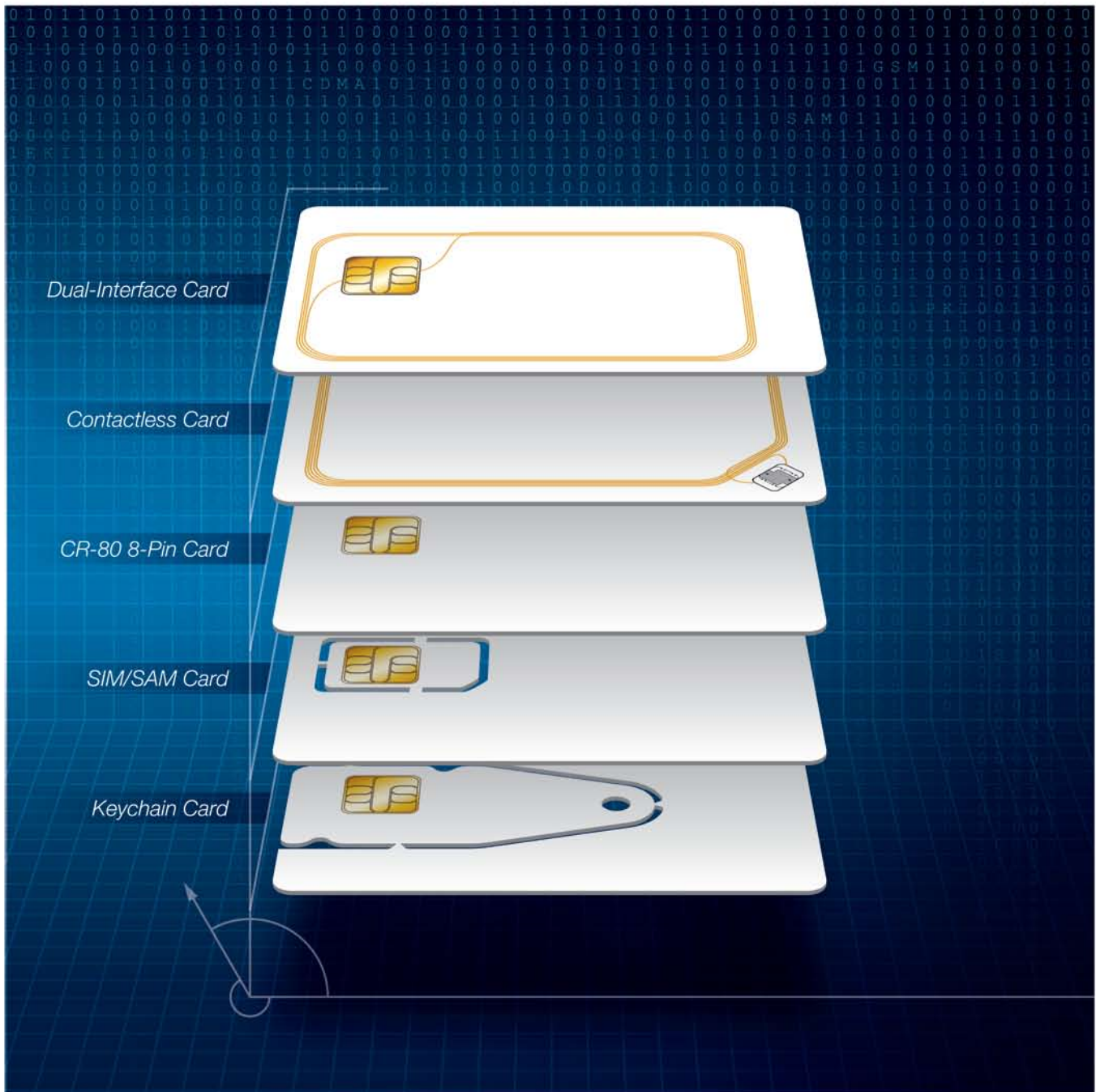


# Smart Card

## Product Selection Guide



Smart cards can improve any transaction involving data and value. When you design your smart card system, comprehensive planning means optimal results. This guide is meant for general reference only, and does not cover every possible design step and contingency.

## The First Four

1. Do you require a completely original design? Or is there an existing application that you can use? (For the latter, please visit CardLogix Smart Partners at <http://www.cardlogix.com/smartpartners/>)
2. Is there a clear business case? Does it include financial and consumer behavior factors?
3. Will the smart card handle data, value, or both? Adding a value function increases system design security and complexity.
4. What are the card's essential features? With multiple functionalities, prioritize, starting with the most important one and phase in additional features incrementally.

## Basic Setup

1. Will the system be single-application or multi-application?
2. Are there industry standards (e.g. ISO, EAL, or ETTSI) to conform to for specific encryption or chip requirements?
3. What information do you want to store in the cards?
4. How much memory is required for the applications?
5. If the system is multi-application, how will you separate different types of data?
6. Will data be obtained from a database or loaded each time?
7. Will this data concurrently reside on a database?
8. How many smart cards will be needed?
9. Have card or infrastructure vendors been identified? What are their lead times?
10. What are the required readers, handsets, terminals, and software?
11. Is a Card Management System (CMS) necessary?
12. How many types of artwork will be included in the issuance?
13. Who will design the artwork?
14. What is needed on the card (e.g. signature panels, magnetic stripes, embossing, etc.)?

## Value Applications

1. Is value in your cards reloadable or one-time use?
2. How will you distribute the cards?
3. How will cards be activated and loaded with value?
4. Will there be a refund policy?
5. What is the minimum and maximum value to store on each card?

## Security

1. What are the security requirements?
2. Does all of the data need to be secure? Or only some?
3. Who will have access to this information?
4. Who will be allowed to change this information?
5. In what manner will you secure this data? (e.g. encryption, host passwords, card passwords, PINs, etc.)
6. Should keys/PINs be customer or system activated?
7. How will you identify the card issuance and versions?
8. Will the system utilize PKI and Digital Certificates? If so, how will they be managed?
9. What about security printing options? (e.g. guilloches, microprinting, holograms, hidden images, etc.)

## Deployment Recommendations

1. Establish clear and achievable program objectives
2. Analyze the application and IT environment
3. Make sure the organization has a stake in the project's success and that management buys into the program
4. Set a budget
5. Name a project manager
6. Assemble a project team and create a team vision
7. Graphically create a dataflow diagram
8. Assess the card and reader options
9. Write a detailed specification for the cards and system
10. Set a realistic schedule with inchstones and milestones
11. Establish security parameters for people and the system
12. Build your on-card and host file structures
13. Phase in each system element and test as you deploy
14. Reassess your system for security leaks
15. Deploy the first phase of cards and test the system
16. Train the key employees responsible for each area
17. Set up a system user manual
18. Check the reporting structures
19. Create contingency plans, should problems arise
20. Deploy and announce your system
21. Advertise and market your system

CardLogix' Smart Toolz<sup>®</sup>, M.O.S.T. Toolz<sup>™</sup>, and Java-based open source software enable low-cost, high-performance system development for identity and stored value. Geode<sup>™</sup>, S@t Manager, and VirtuoSimo<sup>™</sup> speed handset and operator solutions for mobile applications. For expert system integration, these tools, plus other hardware, mesh together for a best of breed smart card-based system.

## Smart Toolz<sup>®</sup>

Smart Toolz is a comprehensive suite of software and hardware components that includes everything you need to develop contact and contactless memory smart card applications. The



toolkit features the CardAppz<sup>®</sup> software, enabling marketing professionals to fully demonstrate a card's capabilities within a fully configurable card database and system. Also included is the Card Configuration Utility software, allowing designers to configure a card's parameters, load data to the card, and

then communicate to the card through the supplied Winplex<sup>®</sup> middleware.

## M.O.S.T. Toolz<sup>®</sup>

Designed specifically for multi-application and high security microprocessor-based smart card systems, the M.O.S.T. Toolz<sup>™</sup> Microprocessor Card Development Kit features robust software and hardware components for rapid system development.

M.O.S.T. Toolz gives you the power to deliver multiple applications and services on a single card, allowing for fast system design and easy updating without the need for card re-issuance.



## Embedded Toolz<sup>™</sup>

The Embedded Toolz<sup>™</sup> SDK includes all the components, firmware, and software you need to prototype your product's smart cards and embedded readers. The kit comes complete with a full schematic, driver software, and source code to allow easy interfacing with your host processor and system hardware. The supplied reader chip is compatible with the widest range of smart cards and protocols available. When combined with Smart Toolz or M.O.S.T. Toolz, reading and configuring your cards is a snap.

The Embedded Toolz kit contains ten smart cards, a prototyping reader board with card sockets and USB input cable, plus a CD with sample code, schematics, manual, FAQ, and design tips.

## Typical Card System

### Card Configuration



Contact & contactless card configuration



File creation utility software



SIM card configuration software

### APIs / Classes / Libraries



POS system for ticketing and stored value



API for card encoding and issuance



API for gaming and hospitality



General purpose API

### Application Development



Database demo software



Complete SDK for OEM designs



Application for making memory demos



Application tool for SIM phone browsers

## Telecom Tools

CardLogix has you covered from SIMToolKit configuration tools to complete Java SIM and handset emulation solutions. Our goal is to make tools easy to use so your design is done right the first time and gets to market faster. We offer the best of breed tools for your development project. Some of them are even free, based on production commitments. Contact your CardLogix representative to get started today.



## Middleware Support

- PCSC industry standard API
- All standardized PIV II Middleware meeting
- SP800-73-1 requirements
- ImageWare Systems Card Management Systems (CMS's)
- Intercede CMS
- MovieGold® API for Ticketing, Stored Value, and POS systems
- Printplex® API for Card Encoding and Issuance
- RSA PIV II Middleware and CMS
- SafeSign Middleware Cryptographic Service Provider (CSP)
- SafeSign Token Manager
- Worldwide Trust CMS's
- Wimplex®, a general purpose API
- Trakplex® API for Gaming and Hospitality
- Charismathics CSP and PKI Middleware

## Additional Card Options

- Lithographic card printing
- Guilloches and rosettes
- Microprinting
- Laser engraving
- Magnetic stripes (HiCo, LoCo, and colored)
- Card punching
- Optically Variable Devices (OVD's)
- Holograms and holomags
- Barcode printing
- Serialization and variable image printing
- Tamper-evident signature panels
- Ultraviolet inks
- Hidden images (Card Validator® graphics)
- Color shifting inks
- Colored interlayers

## Encoding Options

CardLogix can program your card orders, including magnetic stripe encoding and software loading. Fulfillment services are available for all orders (e.g. affixing cards to special carriers, such as promotional collateral). You can also order cards serialized and inserted into envelopes that can be stamped and mailed. Card lots can also be individually sleeved or shrink-wrapped for non-secure delivery.

Our Magnetic Stripe Cards can be encoded to the industry specifications set by leading manufacturers of automated banking equipment for tracks 1, 2, and 3.

CardLogix can load Java applets and all standard types of data, such as identification records, health histories, etc. For security applications, CardLogix can also load the card with digital certificates, transport keys, and encrypted keys.

## Applet Support

- PIV II for Identity systems
- SafeSign SSO
- ICAO passport applets
- Match on-card biometric applets
- One-time password and digital signatures for GSM phones
- SMS applets
- Emergency medical record system applet
- Navy Cash applet

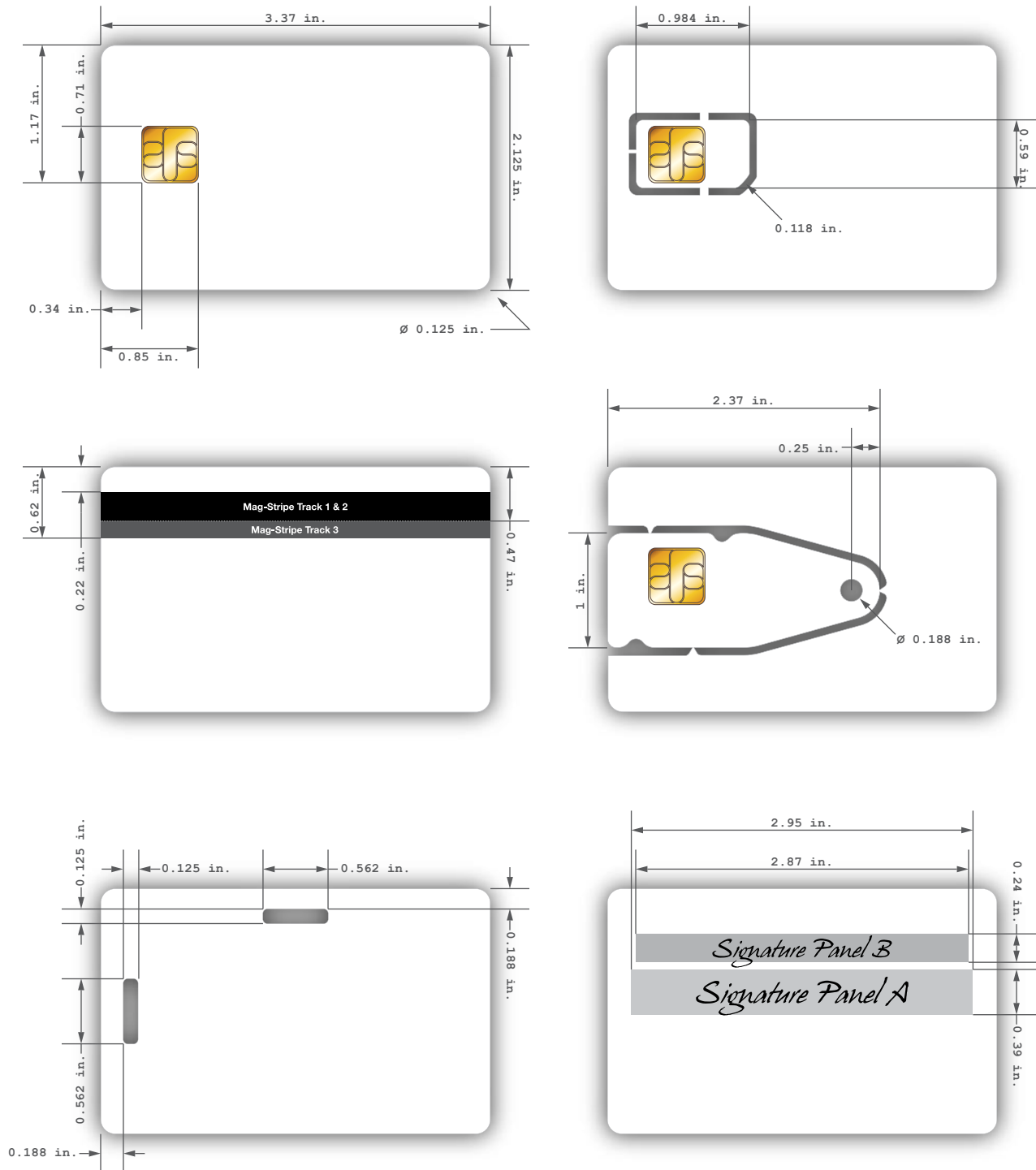
## Fulfillment & Packaging Options

- Letter and Z-fold mailing insertions
- Card wallets
- Tyvek card sleeves
- Card wallet books
- CD Connect cards
- Retail card hangers and blister packaging
- Customized shrink-wrap bundles
- Cards with peel-off coupons
- Tamper-evident packaging



# Smart Card Dimensions & Specifications

Note: Drawings are 2:3 scale.



Additional smart card form factors include:

- USB jump drives
- E-passports
- SD cards
- miniSD cards
- Laundry tags

CardLogix offers cards in the following substrates:

- Commercial grade
- Biodegradable grade
- Precision identity grade
- Government certified grade
- Molded ABS (for SIM cards)

## Memory Smart Cards

CardLogix Part Number	User Memory	Issuer Memory	Type	Functionality / Applications	Security Features	Communication Protocols	Supported Readers*	Maximum Supply Current
CLXSA002KA2	2 kbits	N/A	Memory	Small record storage, loyalty, conventions, digital receipts	Host-based only	PC	A, C, I, O	3 mA
CLXSA008KA7	8 kbits	N/A	Memory	Small record storage, loyalty, conventions, digital receipts	Host-based only	PC	A, C, I, O	3 mA
CLXSA016KA8	16 kbits	N/A	Memory	Data / record storage, health informatics, loyalty, conventions, digital receipts	Host-based only	PC	A, C, I, O	3 mA
CLXSA032KA9	32 kbits	N/A	Memory	Data / record storage, health informatics, loyalty, conventions, digital receipts	Host-based only	PC	A, C, I, O	3 mA
CLXSA064KA3	64 kbits	N/A	Memory	Data / record storage, health informatics, loyalty, conventions, digital receipts	Host-based only	PC	A, C, I, O	3 mA
CLXSA128KA4	128 kbits	N/A	Memory	Data / record storage, health informatics, loyalty, conventions, digital receipts	Host-based only	PC	A, C, I, O	3 mA
CLXSA256KA5	256 kbits	N/A	Memory	Data / record storage, health informatics, loyalty, conventions, digital receipts	Host-based only	PC	A, C, I, O	3 mA
CLXSA512KD5	512 kbits	N/A	Memory	Data / record storage, health informatics, loyalty, conventions, digital receipts	Host-based only	PC	A, C, O	3 mA
CLXSA001MD1	1 Mbit	N/A	Memory	Data / record storage, health informatics, loyalty, conventions, digital receipts	Host-based only	PC	A, O	3 mA
CLXSA004MF1	4 Mbits	N/A	Memory	Data / record storage, health informatics, loyalty, conventions, digital receipts	Host-based only	SPI	Custom	3 mA
CLXSA001KK1	1 kbits	644 bits	Smart Memory	Access control, stored value, data / record storage, health informatics, loyalty	Read / write password protection	7816 Synchronous	A, C, I, O	3 mA
CLXSA001KK2	1.5 kbits	644 bits	Smart Memory	Access control, stored value, data / record storage, health informatics, loyalty	Read / write password protection	7816 Synchronous	A, C, I, O	3 mA
CLXSA002KK3	2 kbits	644 bits	Smart Memory	Access control, stored value, data / record storage, health informatics, loyalty	Read / write password protection	7816 Synchronous	A, C, I, O	3 mA
CLXSB002KB5	2 kbits	N/A	Smart Memory	Small record storage, loyalty, conventions, digital receipts	Security code, fuse lock, write protect	7816 Synchronous	A, C, I, O, S	5 mA
CLXSA001KL1	1 kbits	2 kbits	Smart Memory	Access control, stored value, data / record storage, health informatics, loyalty	Read / write password protection	PC & T=0	A, C, I, O, S	5 mA
CLXSA004KK4	4 kbits	2 kbits	Smart Memory	Access control, stored value, data / record storage, health informatics, loyalty	Read / write password protection	PC & T=0	A, C, I, O, S	5 mA
CLXSA008KK5	8 kbits	2 kbits	Smart Memory	Access control, stored value, data / record storage, health informatics, loyalty	Read / write password protection	PC & T=0	A, C, I, O, S	5 mA
CLXSA016KK6	16 kbits	2 kbits	Smart Memory	Access control, stored value, data / record storage, health informatics, loyalty	Read / write password protection	PC & T=0	A, C, I, O, S	5 mA

\*Wincelex supported reader brands: ACS, Cardcom, ID Tech, Omnikkey, SCM

## Contactless Smart Cards

CardLogix Part Number	User Memory	Manufacturer Description	Manufacturer Part Number*	Functionality / Applications	Security Features	Communication Protocols
CLXRND04KP3	0.5 kByte	Crypto RF	AT - AT88SC0404CRF	Building access, transportation, purse / wallet, and stored value	Anti-collision, authentication	ISO 14443 B
CLXRND08KP4	1 kByte	Crypto RF	AT - AT88SC0808CRF	Building access, transportation, purse / wallet, and stored value	Anti-collision, authentication	ISO 14443 B
CLXRND16KP5	2 kBytes	Crypto RF	AT - AT88SC1616CRF	Building access, transportation, purse / wallet, and stored value	Anti-collision, authentication	ISO 14443 B
CLXRND32KP6	4 kBytes	Crypto RF	AT - AT88SC3216CRF	Building access, transportation, purse / wallet, and stored value	Anti-collision, authentication	ISO 14443 B
CLXRND64KP7	8 kBytes	Crypto RF	AT - AT88SC6416CRF	Building access, transportation, purse / wallet, and stored value	Anti-collision, authentication	ISO 14443 B
CLXRND128KP8	16 kBytes	Crypto RF	AT - AT88SC12816CRF	Building access, transportation, purse / wallet, and stored value	Anti-collision, authentication	ISO 14443 B
CLXRNS12UN1	64 Bytes	MIFARE Ultralight	NX - MFO IC U1	Building access, transportation, purse / wallet, and stored value	Anti-collision	ISO 14443 A
CLXRND002KN2	320 Bytes	MIFARE Mini	NX - MF1 IC S20	Building access, transportation, purse / wallet, and stored value	Anti-collision, RNG, and 2 keys	ISO 14443 A
CLXRND008KN3	1 kBytes	MIFARE STD (Classic)	NX - MF1 IC S50	Building access, transportation, purse / wallet, and stored value	Anti-collision, RNG, and 2 keys	ISO 14443 A
CLXRND032KN4	4 kBytes	MIFARE STD (Classic)	NX - MF1 IC S70	Building access, transportation, purse / wallet, and stored value	Anti-collision, RNG, and 2 keys	ISO 14443 A
CLXRND032KN5ED	4 kBytes	MIFARE DESFire	NX - MF3 IC D40	Building access, transportation, purse / wallet, and stored value	Anti-collision, RNG, DES, and 1.4 keys	ISO 14443 A

\*Manufacturers: AT = Atmel, NX = NXP

## Credentsys® Dual-Interface Cards

CardLogix Part Number	User Memory	Operating System	Functionality / Applications	Supported Algorithms	Communication Protocols	Applets in ROM
CLXSU512KJ3/DU	72 kbytes	Java Card Platform 2.2.1, Global Platform 2.1.1	National ID programs, healthcare, informatics, driver licenses, voter registration, enterprise IDs	AES-128, MD5, DES, TDEA, RSA-1024, RSA-2048, SHA-1, SHA-256	T=0, T=1, ISO 14443 B	PV II, SafeSign
CLXSU001M4J/DU	128 kbytes	Java Card Platform 3.0, Global Platform 2.2.1	National ID programs, healthcare, informatics, driver licenses, voter registration, enterprise IDs	AES-128, AES-192, AES-256, MD5, DES, TDEA, RSA-1024, RSA-2048, SHA-1, SHA-256, ECC-163, ECC-233, ECC-283	T=0, T=1, ISO 14443 B	PV II, SafeSign

## M.O.S.T.® (Microprocessor-Based) Cards

CardLogix Part Number	User Memory	Functionality / Applications	Security Features	Communication Protocols	Maximum Supply Current
CLXSU064KJ4/T=0ED	8 kbytes	Multifunction, purse / wallet, identity, e-commerce, and campus	Authentication, purse, DES, and 3DES encryption	T=0	3 mA
CLXSU128KJ4/T=0ED	16 kbytes	Multifunction, purse / wallet, identity, e-commerce, and campus	Authentication, purse, DES, and 3DES encryption	T=0	3 mA
CLXSU256KJ4/T=0ED	32 kbytes	Multifunction, purse / wallet, identity, e-commerce, and campus	Authentication, purse, DES, and 3DES encryption	T=0 with PTS	3 mA
CLXSU512KJ4/T=0ED	64 kbytes	Multifunction, purse / wallet, identity, e-commerce, and campus	Authentication, purse, DES, and 3DES encryption	T=0 with PTS	3 mA
CLXSU512KJ8/T=0ED	72 kbytes	Multifunction, purse / wallet, identity, e-commerce, and campus	DSA, authentication, purse, DES, 3DES, and AES encryption	T=0 with PTS	3 mA

## SIM Cards (Java & Delos®)

CardLogix Part Number	User Memory	Type	SIM Application Toolkit (STK) Standard	R-UIM	PIM Phase 2	USIM	OTA	Browser Support
CLXS512KH0/SJVO	64 kbits	Java Card 2.21	GSM 11.11, GSM 11.14	No	No	No	Yes	N/A
CLXS512KH0/SJWV13O	64 kbits	Java Card 2.21	GSM 11.11, GSM 11.14	No	No	No	Yes	WIP 1.3
CLXS512KH0/SJV@2O	64 kbits	Java Card 2.21	GSM 11.11, GSM 11.14	No	No	No	Yes	S@T 2
CLXS001MH2/SJV@2O	128 kbits	Java Card 2.21	GSM 11.11, GSM 11.14	No	No	Yes	Yes	S@T 2
CLXS001MH2/SJWV13O	128 kbits	Java Card 2.21	GSM 11.11, GSM 11.14	No	No	Yes	Yes	WIP 1.3
CLXS256Kxx/SJVT14 *	32 kbits	Java Card 2.21	GSM 11.11, GSM 11.14	No	No	No	No	N/A
CLXS128KF7/D	16 kbits	Delos Native	GSM 11.11, GSM 11.14	No	No	No	No	N/A
CLXS128KF7/DP2	16 kbits	Delos Native	GSM 11.11	No	Yes	No	No	N/A
CLXS256KG1/DP2	32 kbits	Delos Native	GSM 11.11	No	Yes	No	No	N/A
CLXS256KF3/DST14O	32 kbits	Delos Native	GSM 11.11, GSM 11.14	No	No	No	Yes	N/A
CLXS256KF3/DST14OW12	32 kbits	Delos Native	GSM 11.11, GSM 11.14	No	No	No	Yes	WIP 1.2
CLXS256Kxx/DST14O@2*	32 kbits	Delos Native	GSM 11.11, GSM 11.14	No	No	No	Yes	S@T 2
CLXS512KG2/DSTRU	512 kbits	Delos Native	GSM 11.11	Yes	No	No	No	N/A

\*256 kbit and 512 kbit Java-based SIMs are available with full browser support on a custom order basis.

# CardLogix Quality

CardLogix Corporation is absolutely committed to providing flawless products and services to our customers, in partnership with equally committed suppliers and authorized dealers.



- California C Corporation
- CA Resale SREAA 97-124323
- D&B No. 867418899
- SIC Codes 3577, 3089, 5162
- UNSPCSC Code 32101617
- Harmonized Code 8542.10.0000
- NAICS Codes 334119, 326199, 334418, 334519, 42261, 51421
- CAGE Code 1KV39
- Congressional District No. 47



16 Hughes, Suite 100 · Irvine, CA 92618 · United States  
Phone +1 949 380-1312 · Fax +1 949 380-1428  
[www.cardlogix.com](http://www.cardlogix.com) · [sales@cardlogix.com](mailto:sales@cardlogix.com)