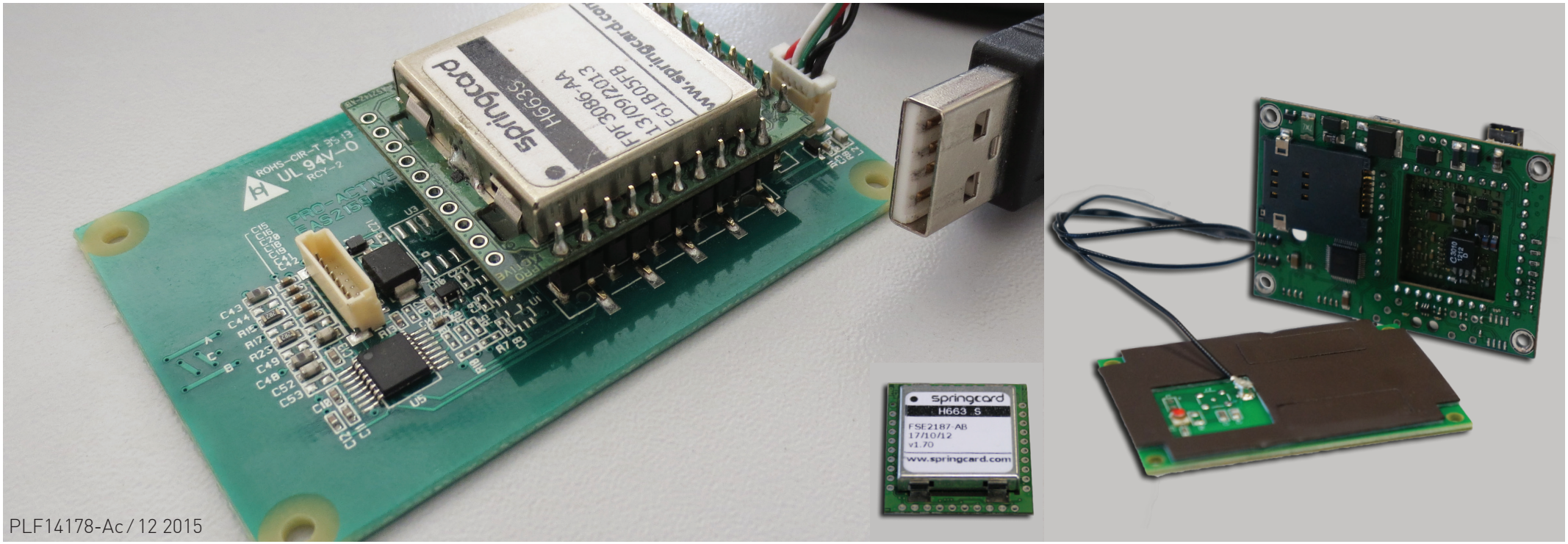
‘H’ Series : OEM PC/SC Contactless Couplers

H663 / H663-USB / TwistyWriter HSP / CrazyWriter HSP



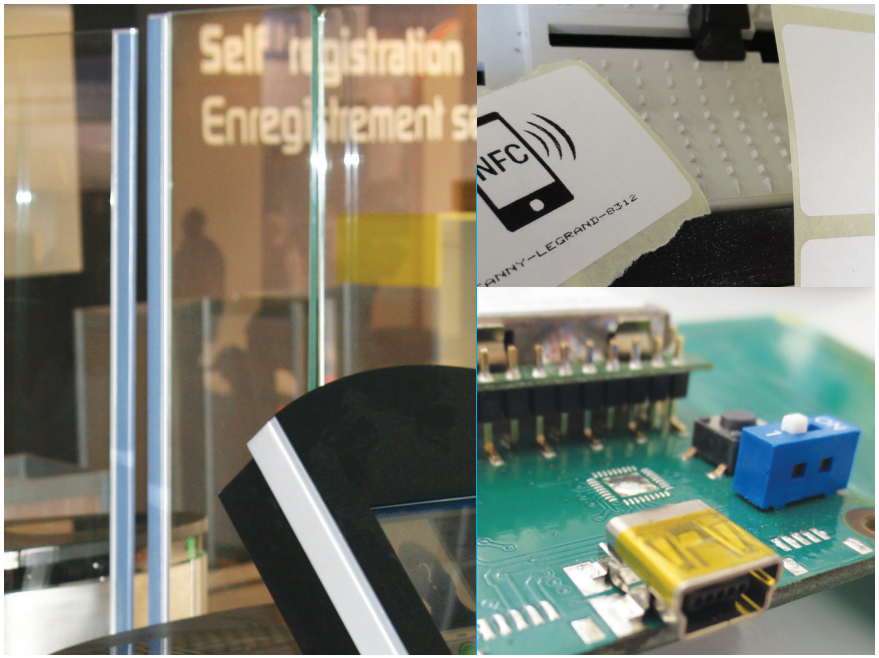
PLF14178-Ac / 12 2015

SpringCard 'H' Series benefits

SpringCard 'H' Series is a complete family of OEM readers/writers covering all **13.56MHz RFID and NFC standards** and implementing the PC/SC standard over USB (CCID).

Designed with **ease of use**, **interoperability** and **compliance to standards** as primary objectives, **SpringCard 'H' Series** takes benefit of the high speed USB interface and a fast CPU to ensure **short transaction times**, a key feature when it comes to card reading or issuing in-the-field.

In addition to these first-class RFID and NFC performances, the **SpringCard H663 'C'** and the **SpringCard CrazyWriter HSP** include a smart card interface (ISO 7816) with **up to 4 slots for SIM/SAM cards** and 1 slot for a **ID-1 card**. This makes these products an all-in-one contact + contactless solution.



MADE FOR OEMS

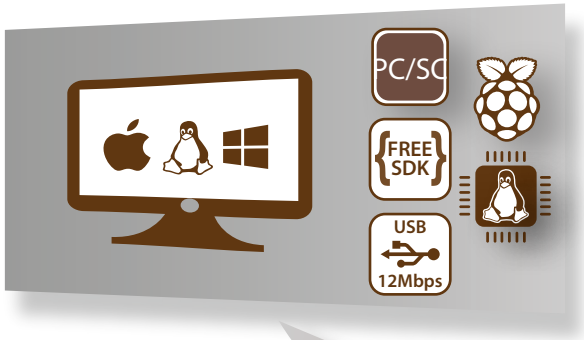
The SpringCard OEM PC/SC Couplers are designed to be integrated in a larger equipment: automated vending machine, POS, turnstyle at a gate, card printer, card issuing machine, kiosk...

SpringCard has a strong experience and commitment in providing industrial-grade solutions. The OEM PC/SC Couplers family is a guaranteed long-life product line. Most products in our portfolio share the same dimensions and electrical characteristics, which allows a smooth transition from one generation to the next one.

DEVELOPMENT MADE EASY

Thanks to the widely adopted PC/SC standard and to a strong support of market-leading technologies (MIFARE, NFC Forum tags...), SpringCard OEM PC/SC Couplers close the gap between the 'contact' smart card and the contactless/RFID worlds.

Drivers are available for Microsoft Windows, Linux and MacOS X. SpringCard provides a free SDK as well as an efficient support service to help your developers create your solution smoothly and quickly.



springcard

OEM PC/SC Couplers

NFC / RFID @ 13.56MHz Reader/Writer

MIFARE® Classic, MIFARE DESFire®, MIFARE Plus®,
MIFARE UltraLight®, SmartMX®, NTAG®...
FeliCa (ID only), FeliCa Lite-S
Calypso CD21, CD97, GTML (incl. Innovatron Radio Protocol)
Infineon SLE66, ST MicroElectronics ST19, Atmel AT88
ST MicroElectronics SR, SRI, SRIX, Atmel CryptoRF
Inside Secure PicoTag / HID iClass
etc.

ISO/IEC 14443 · JIS X6319-4 · NfcA NfcB NfcF · MIFARE®

ISO/IEC 15693 · NfcV

NXP ICODE®-SLI
Texas Instrument Tag-it™
ST MicroElectronics LR
etc.

NFC «peer to peer»
initiator, passive communication mode
(SNEP over LLCP in SDK)

NFC Tags types 1, 2, 3 and 4
Reader mode

NFC objects
in card emulation mode

ISO/IEC 18092 · P2P

Optional SmartCard interfaces

H663AC/H663SC: up to 4 SIM/SAM
+ 1 smartcard (using an external multiplexer)
CrazyWriter-HSP: 1 SIM/SAM on main board
options for 3 SIM/SAM and 1 smartcard slot

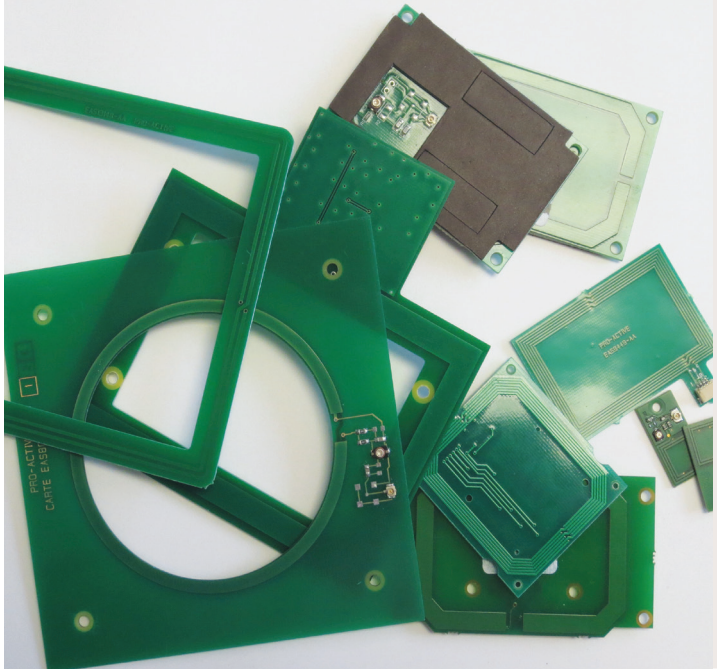
ISO/IEC 7816

H663

OEM PC/SC Module without antenna

Contactless and RFID

- The **H663** Module supports any T=CL contactless smartcard (ISO 14443), including Calypso transport cards and all families of MIFARE cards.
- The **H663** Module is able to read/write any NFC Forum Tag as well as virtually any RFID chip in the ISO 15693 or ISO 18000-3 mode 1 standards.
- There are 2 versions: the **H663** 'A' is designed to drive an unbalanced (asymetric) antenna, where the **H663** 'S' is designed to driver a balanced (symetric) antenna.



Contact smartcard and SIM/SAM

- The 'C' subversions of the **H663** Module are able to drive one T=0 or T=1 smartcard or SIM/SAM directly, with no external component but the SIM/SAM connector.
- Thanks to an optional expansion circuitry, the number of slots goes up to 5: 4 SIM/SAM slots and 1 ID-1 slot.
- Combining a small footprint and the support of high-speed SAMs in a single device, the **H663** 'C' is the ideal module for any application where security and transaction speeds are key concerns.

Versions and order codes

- **SC14182: H663S** Contactless PC/SC Module (unbalanced)
- **SC14183: H663SC** Contact & contactless PC/SC Module (unbalanced)
- **SC14184: H663A** Contactless PC/SC Module (balanced)
- **SC14185: H663SC** Contact & contactless PC/SC Module (balanced)

H663-USB

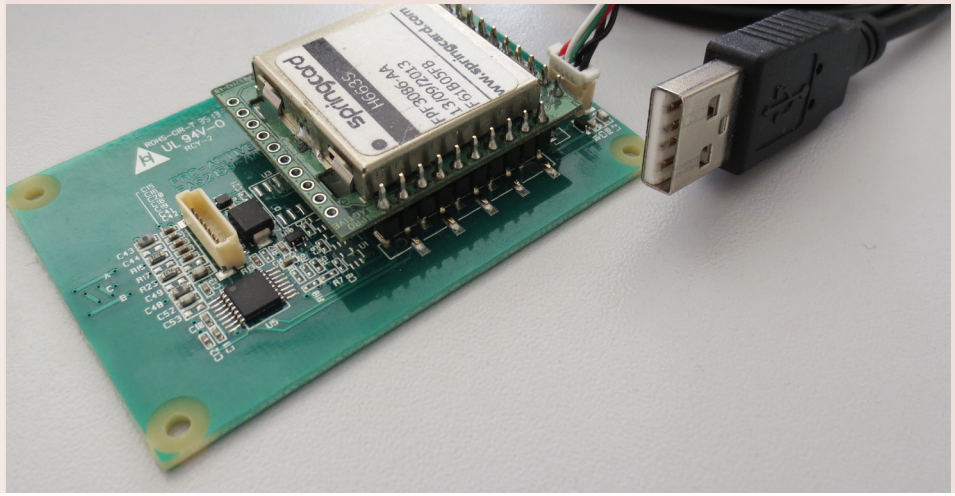
OEM PC/SC Coupler

At a glance

- The **H663-USB** Coupler is the ready-to-use version of the **H663S** Module.
- Its **69x45mm antenna** ensure a communication range up to 75mm with current contactless cards, and 30mm in worst-case scenario.
- The antenna holds the Module itself and a 5-pin industrial-grade connector for USB, making it a single-part **drop-in solution** to add NFC/RFID features to any embedded system supporting PC/SC over USB.
- The geometry and mounting holes are the same as the one of earlier **SpringCard** products, making H663-USB suitable to upgrade your existing solution based on K531, K632 or K663.

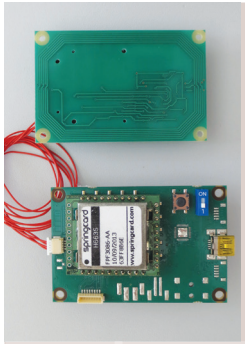
Order code

- **SC3016: H663-USB** Contactless PC/SC Coupler



'NAKED' MODULE WITHOUT ANTENNA OR READY-TO-USE COUPLER WITH ANTENNA?

WITH ANTENNA	WITHOUT ANTENNA
SpringCard OEM contactless couplers feature a 45x69mm antenna	A custom antenna (PCB or flex) will fit exactly into your design. Smaller sizes are possible
This size is optimized for ID-1 cards, and will work out of-the box with all classes of PICCs (1,2,3,4, 5 and 6)	Knowing precisely the requirements of your system is the key to designing the perfect antenna that would cover your needs
Typical range is up to 0.5 to 5cm for most cards, more to 7.5cm for some of them	There are application notes to draw the coil and calculate the tuning circuit, but designing a RFID antenna remains touchy! 4
You'll find also in SpringCard's portfolio a few different antennas	SpringCard has a strong experience in the matter
SOLUTIONS?	
Contact us to choose the antenna that will match to your specific requirement (greater or shorter operating distance, tag smaller than class 6 PICC, ...)	SpringCard is able to draw prototype and validate the very antenna you need. Contact us for a quote!



TwistyWriter HSP

OEM PC/SC Coupler

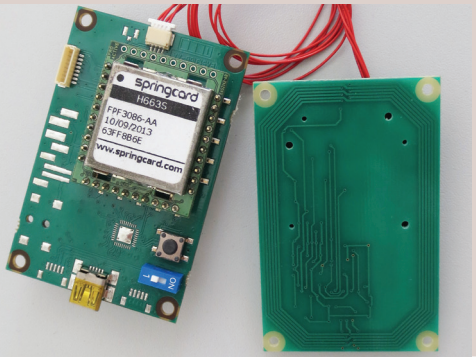
with remote antenna (balanced)

At a glance

- The **TwistyWriter HSP** Coupler provides exactly the same features as the **H663** Module and **H633-USB** Coupler, with the benefit of a remote antenna connected through a **twisted 4-wire cable**.
- The flat **69x45mm antenna** ensure a communication range up to 75mm with current contactless cards, and 30mm in worst-case scenario. Custom antennas could be offered.
- The 69x45mm main board holds the Module. Both a 5-pin connector and a standard mini-B jack provide USB connection.

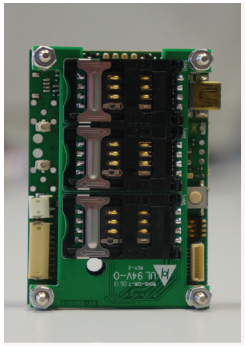
Order code

- **SC14190: TwistyWriter HSP** Contactless PC/SC Coupler with remote antenna, 69x45mm antenna and 30cm cable for antenna incl. (USB cable not incl.)



CHOOSING BETWEEN A BALANCED OR AN UNBALANCED ANTENNA

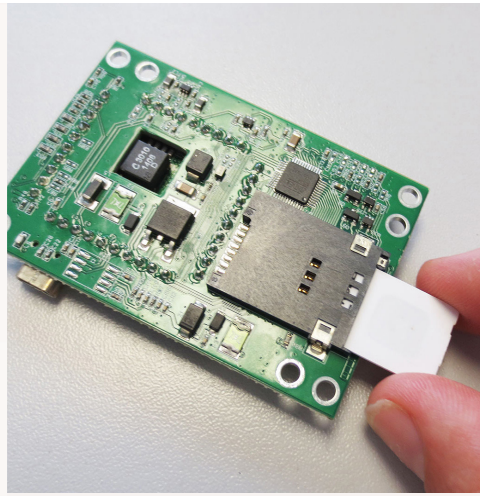
UNBALANCED (ASYMETRIC)	BALANCED (SYMETRIC)
The antenna is made of a single coil and a ground layer for shielding	The antenna is made of two coils. One turns clockwise, the other anti-clockwise
A 50ohm matching circuit is required to connect the antenna to the reader through a single-core coaxial cable	There's no matching circuit. The antenna is connected to the reader using 3 lines: P, M and Gnd (ground)
Thanks to the coaxial cable, the distance between the reader and the antenna may reach 1.5m	We recommand using 2 twisted pairs (P+Gnd, M+Gnd). The cable shall be no longer than 30cm
Due to the tolerances on the PCB, a trimming capacitor is required to achieve the exact match	No trimming and no shielding are required
In some situations, the trim may also be used to adapt the antenna's tuning to a particular environment (conductive materials in the nearby)	A balanced antenna offers better performances than an unbalanced antenna of the same size and is easier to design
PRODUCTS?	
CrazyWriter-HSP is a typical example of a contactless coupler with a remote unbalanced antenna	TwistyWriter-HSP is a typical example of a contactless coupler with a remote balanced antenna
Choose H663A module if you plan to use a custom unbalanced antenna	H663-USB also has a balanced antenna (but not remote)
	Choose H663S module if you plan to use a custom balanced antenna



CrazyWriter HSP

Multi-interface OEM PC/SC Coupler

with remote antenna (unbalanced)

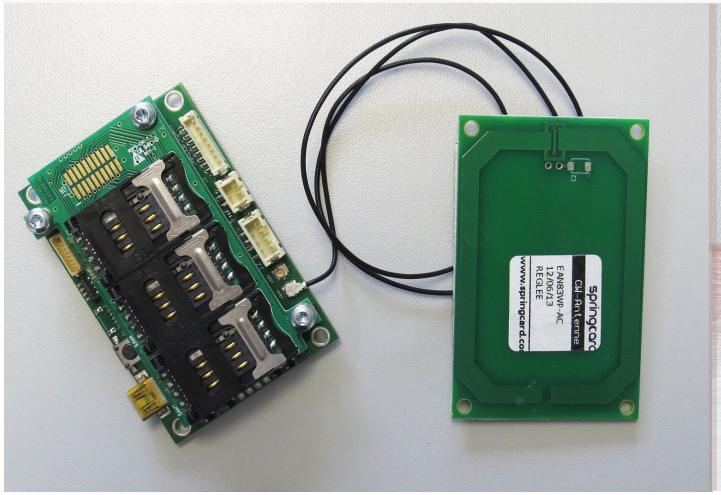


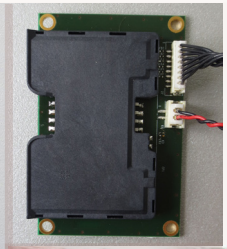
Contactless and RFID

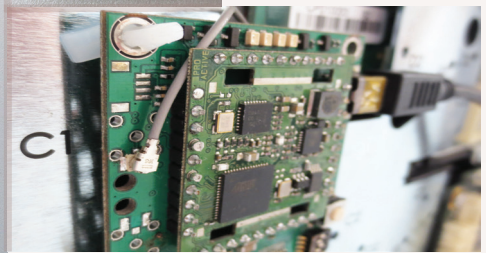
- The **CrazyWriter HSP** Coupler provides exactly the same features as the **H663** Module and **H633-USB** Coupler, with the benefit of a remote antenna connected through a single **micro-coax 50Ω cable**.
- The flat **69x45mm antenna** ensure a communication range up to 75mm with current contactless cards, and 30mm in worst-case scenario. Custom antennas could be offered.
- The 'Dual' version is able to drive **2 antennas** in a round-robin scheme.

Contact smartcard and SIM/SAM

- The 69x45mm mainboard holds **1 slot** for a ISO 7816 SIM/SAM card.
- An optional daughter board brings up the product's capabilities to **4 SIM/SAM slots**.
- A 8-point connector is available to connect a **ID-1** smart card socket.
- The **CrazyWriter HSP** supports T=0 and T=1 up to TA1=97 (500kbps) as well as the Calypso 'HSP' protocol.
- 5V, 3V and 1.8V cards are supported; each slot could be configured individually for EMV or ISO mode.



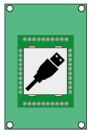




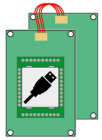
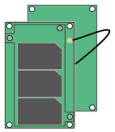
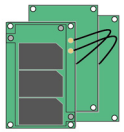
Versions and order codes

- **SC0168: CrazyWriter HSP** Contact & contactless PC/SC Coupler with 1 SAM and 1 remote antenna (50Ω)
- **SC14148: CrazyWriter HSP Dual** Contact & contactless PC/SC Coupler with 1 SAM and 2 remote antennas (50Ω)
- **SC0168**: 3 SAM daughter board for CrazyWriter HSP or CrazyWriter HSP Dual
- **SC0170**: ID-1 smart card slot for CrazyWriter HSP or CrazyWriter HSP Dual

Technical data

	H663S / H663SC	H663A / H663AC	H663-USB
			
RFID/NFC Standards	ISO 14443 A-B, ISO 15693, NFC peer-to-peer (ISO 18092 initiator, passive communication mode)		
Carrier frequency	13.56MHz (RFID HF, NFC)		
RF field level			Typ. 3A/m at 0.5cm
Operating distance	Depends on antenna		Typ.: 0.5-5cm, up to 7.5cm [2]
Card/tag baudrate	26kbps (ISO 15693), 106/212/424/848kbps (ISO 14443), 212/424kbps (ISO 18092)		
Antenna	Balanced, not included [1]	Unbalanced, not included [1]	Integrated, 69x45mm, balanced [3,4]
Distance antenna/module	Up to 25cm using 2 pairs (twisted)	Up to 150cm using a 50Ω coax.	N/A
Smartcard interface(s)	**SC/AC versions only :** supports up to 4 SIM/SAM cards and 1 ID-1 smartcard slot through optional smartcard multiplexe		-
Standards Card clock / baudrate	ISO 7816-3 and -4 (T=0, T=1) Card clock : 4MHz / card baudrate : up to 250kbps (TA1=96)		-
Power class	Depends on external hardware		-
Connectors	4 x 10 pins, 2.54mm step		USB: JST SHR-5 JST SHR-8 (control pins + serial option)
Communication with host	USB 2.0 (1.1 compliant) 12Mbps - powered by the host (< 400mA @ 5V)		
Standard	CCID 1.1 profile - PC/SC v 2.01		
Drivers & SDK	PC/SC driver for Windows / works with PCSC-Lite under Linux, Mac OS X and other Unix systems. Free SDK for SpringCard PC/SC couplers		
Size (WxHxD)	26 x 31 x 9mm		69 x 45 x 11mm
Environment			
Temperature	Operating: -20°C – +70°C / Storage: -40°C – +80°C		
Humidity	0 – 90% (non condensing)		
MTBF	500 000 hours		
Approvals	Radio : EN 300 330 - EMC : EN 301 489 - CE mark – FCC class B part 15 (pending/on request)		
Environmental	RoHS, WEEE		
Warranty	2 years		

(1) SpringCard has a strong expérience on designing antennas. Please contact our sales team if you need a custom antenna.
(2) The actual max. operating distance depends heavily on the card/tag's characteristics, on the baudrate and on the environment.
(3) This antenna size (69x45mm) is optimized for communication with ID-1 sized cards/tags. The antenna features a ferrite shield on the back.
(4) SpringCard's portfolio contains various antenna sizes and shapes. Don't hesitate to contact our sales team in order to select the best antenna for your very project.
(5) Other lengths available on request.

TwistyWriter HSP	CrazyWriter HSP	CrazyWriter HSP Dual
		
ISO 14443 A-B, ISO 15693, NFC peer-to-peer (ISO 18092 initiator, passive communication mode)		
13.56MHz (RFID HF, NFC)		
Typ. 3A/m at 0.5cm		
Typ.: 0.5-5cm, up to 7.5cm [2]		
26kbps (ISO 15693), 106/212/424/848kbps (ISO 14443), 212/424kbps (ISO 18092)		
Remote, balanced, 69x45mm [3,4]	Remote, unbalanced, 69x45mm [3,4]	2 x Remote, unbal., 69x45mm [3,4]
25cm 4-wire twisted cord [5]	50 cm micro-coax. [5]	2 x 50cm micro-coax. [5]
1 x ID-000 SIM/SAM slot	1 x ID-000 SIM/SAM slot on main board. Optional 3 x ID-000 slots board	
ISO 7816-3 and -4 (T=0, T=1) Card clock : 4MHz / card baudrate : up to 250kbps (TA1=96)		
B (3V)	A,B or C (5V, 3V, 1.8V)	
USB: JST SHR-5 and mini type-B JST SHR-8 (serial option) antenna: JST SHR-4	USB: JST PHR-4 and mini type-B JST SHR-8 (serial option) ID-1 card: JST ZHR-8 (contacts) + JST PHR-2 (presence) antenna(s): micro coax	
USB 2.0 (1.1 compliant) 12Mbps - powered by the host (< 400mA @ **5V**)		
CCID 1.1 profile - PC/SC v 2.01		
PC/SC driver for Windows / works with PCSC-Lite under Linux, Mac OS X and other Unix systems. Free SDK for SpringCard PC/SC couplers		
Main board : 69 x 45 x 15mm / antenna : 69 x 45 x 3mm		
Operating: -20°C – +70°C / Storage: -40°C – +80°C		
0 – 90% (non condensing)		
500 000 hours		
Radio : EN 300 330 - EMC : EN 301 489 - CE mark – FCC class B part 15 (pending/on request)		
RoHS, WEEE		
2 years		

YOUR EXPERT IN CONTACTLESS SOLUTIONS

SpringCard offers a wide range of products to meet as many as possible of needs and use cases.
With a 15-year experience in contactless smartcards, communication technologies and development on embedded or mobile systems, SpringCard R&D Team is also a valuable partner to design your own solution or product.

SpringCard in the world

Angers - Paris - San Diego - San Francisco - Sydney - Tokyo

www.springcard.com

Products designed and manufactured in France

SPRINGCARD SAS au capital de 227 000 € (FRANCE) - RCS EVRY B 429 665 482 - NAF 722 C - VAT #: FR 27 429 665 482