

springcard®

## FunkyGate NFC

Wall-mounted NFC/RFID Readers  
for corporate Access Control

TCP/IP on Ethernet / RS-485 / Dataclock / Wiegand

PLF13276-AA/08 2014

# The FunkyGate NFC family

The **SpringCard FunkyGate NFC** is a complete range of wall-mounted readers for access control in offices or corporate buildings.

Sharing an exclusive design, both elegant and robust, the **FunkyGate NFC** family covers the widest range of technical requirements: network reader using TCP/IP over Ethernet, RS-485 serial link, compatibility with legacy systems (Dataclock or Wiegand)...

## PERFORMANCES, WITHOUT COMPROMISE

Readers in the **FunkyGate NFC** family take benefit of a fast 32-bit core the **SpringCard** NFC and RFID interface, one of most complete in the market. It ensures support of all standard protocols (ISO / IEC 14443 and 15693, Calypso, Tags NFC, SNEP, ...) as well as market-leading proprietary technologies (MIFARE, MIFARE Plus, DESFire, FeliCa, ...).

## ID, RAW DATA, FORMATTED DATA? JUST ASK!

Depending on the kind of media you use as access control tokens, you will configure the **FunkyGate NFC** to look for a specific type of proximity cards, RFID labels or NFC tags.

As soon as one of these item is found in the RF field, the reader fetches the relevant information. It could be either only the **serial number**, or for a wired-logic **memory card** the content of a page, block or sector. For a **contactless smart card**, the reader is also able to retrieve a **record from a particular file** within a particular application.

## 4 TEMPLATES FOR READING

Thanks to its 4 templates for reading, the **FunkyGate NFC** supports up to 4 different kind of access control cards or tags. This unique feature makes it possible to install **a single reader per door**, while continuing to give access to numerous generations of access badges, including from different vendors. It is also possible to accept in one building a 'mix' of proximity tokens coming from external sources.

The FunkyGate NFC is the first access control reader on the market able to receive and decode a message sent by a smartphone using the 'peer-to-peer' mode. This paves the way for innovative NFC solutions using the widest ranges of existing NFC smartphones, even the ones that do not provide an easy card emulation mode.





## SECURE READING

The **FunkyGate NFC** embeds the cryptographic primitives required to secure the reading of DESFire cards (**DES**, **3DES**) and MIFARE Plus cards (**AES**).

Thanks to the processing power and high speed of the **FunkyGate NFC**'s CPU, there's no noticeable change in transaction time, even when the reader uses **authentication and secure reading**.

## A LARGE CHOICE OF OUTPUT FORMATS

After reading a card/tag, the **FunkyGate NFC** forwards the fetched data to the access control system (controller unit or computer).

The format of the data could be finely adjusted to the system's requirements: length between 4 and 128 bytes, decimal (BCD) or hexadecimal, raw text for data stored as a string...

## IN-FIELD SETUP MADE EASY

Loading reader's settings can easily be done in-the-field. The configuration is edited using a PC application '**SpringCard MultiConf**'.

This software may directly upload the new configuration when there's a direct connection between the reader and the computer (TCP/IP or RS-485). Otherwise, the software creates a **secure master card**; present the master card to the reader, and the configuration is applied immediately.

## ALL THE SUPPORTED RFID/NFC TECHNOLOGIES



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®

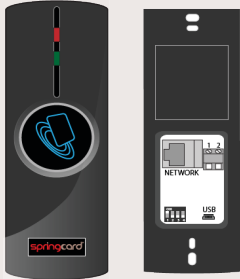
ISO/IEC 15693 NfcV NXP ICODE®-SLI Texas Instrument Tag-it™ ST MicroElectronics LR etc.

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 N™

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# Network-attached readers

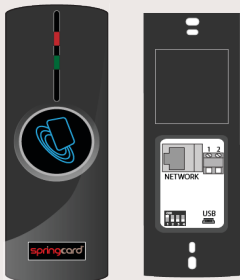


## FunkyGate-IP NFC

NFC & RFID 13.56MHz wall-mounted reader with Ethernet interface

- Ethernet 10/100Mbps, RJ45 plug on the rear
- Communication using TCP/IP (v4), free SDK
- Power input: 2-point screw terminal, wide supply range (9 to 24V DC)
- **Order Code: SC14002**
- Reference manual: PMA13257

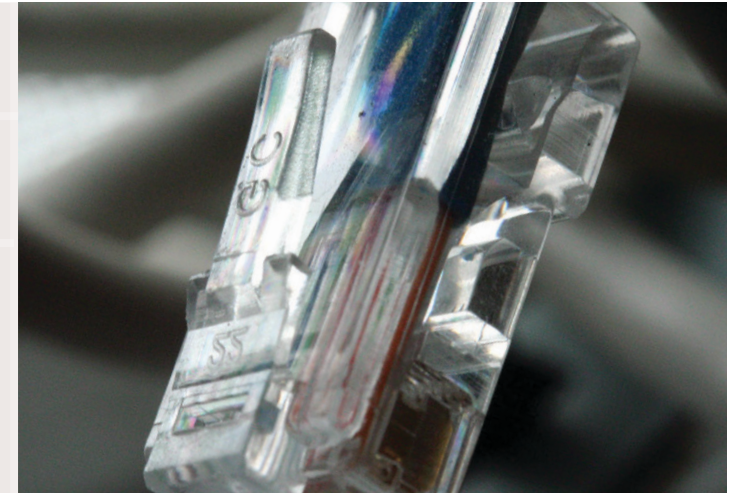
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## FunkyGate-IP+POE NFC

NFC & RFID 13.56MHz wall-mounted reader with Ethernet interface, powered by the Ethernet network

- Ethernet 10/100Mbps, RJ45 plug on the rear
- Communication using TCP/IP (v4), free SDK
- Powered by the network 802.3af (Power Over Ethernet) or through the 2-point screw terminal
- **Order Code: SC14003**
- Reference manual: PMA13257



## TCP/IP OVER ETHERNET

The **FunkyGate-IP / IP+POE NFC** communicates with the access control software (typically running on a controller unit or a server computer) using a robust and efficient client / server protocol.

A free software development kit (SDK) provides all the **code source and examples** you'll need to add this protocol into your equipment (**C and Java**).

## AES SECURITY

The communication stream between the central system and the reader is totally secured (**mutual authentication, integrity, confidentiality**) using 128-bit AES technology.

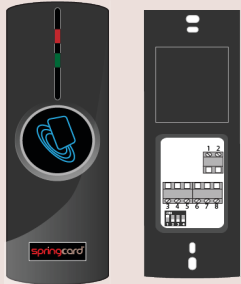
## SIMPLICITY OF HTTP+REST

To set-up quickly a live demo or a proof-of-concept, or to integrate the reader smoothly in a system based on HTTP exchanges, the **FunkyGate-IP / IP+POE** embeds a web server.

A simple **REST API** give access the cards' data, and allows to control the reader's LEDs and buzzer.



# RS-485, Dataclock, Wiegand



## FunkyGate-DW NFC

NFC & RFID 13.56MHz wall-mounted reader with RS-485, dataclock and wiegand interfaces

- In-field configurable output; RS-485, Dataclock (ISO2) or Wiegand
- Configuration by secure 'master cards' or through the RS-485 line
- 2 input lines to drive the Red & Green LEDs directly
- Power input: 2-point screw terminal, wide supply range 9-24V DC
- **Order Code: SC14004**
- Reference manual: PMA13292

## RS-485

The **FunkyGate-DW NFC** features a RS-485 interface at 38400bps or 9600bps.

The 'MK1' protocol is suitable for quick a implementation in a 1-to-1 architecture, where the new 'MK2' protocol is addressed and more complete. A controller unit or a central computer may **address 1 to 128 readers** using this protocol, retrieving the card's data and controlling the status of each LED and buzzer.

A free software development kit (SDK) is available to ease the integration of the **FunkyGate-DW NFC** using RS-485.

## DATA CLOCK

Inherited from magnetic-stripe cards (ISO 7810 'Magstripe'), the Data + Clock interface has two communication lines (data and clock).

The **FunkyGate-DW NFC** implements the ISO2 frame format. The output length is 10, 11 or 12 decimal digits.

## WIEGAND




The Wiegand interface is used by a lot of legacy access control systems, designed for magnetic card readers. It has two data lines, one signaling the '0' bit value (D0) and the other signaling the '1' bit value (D1).

The **FunkyGate-DW NFC** supports data length of 32, 40 or 64 bits. Different protocols or specific output formats could be integrated as an option to fit in your existing system.

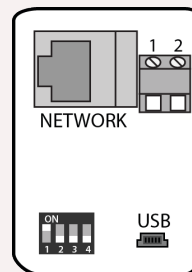
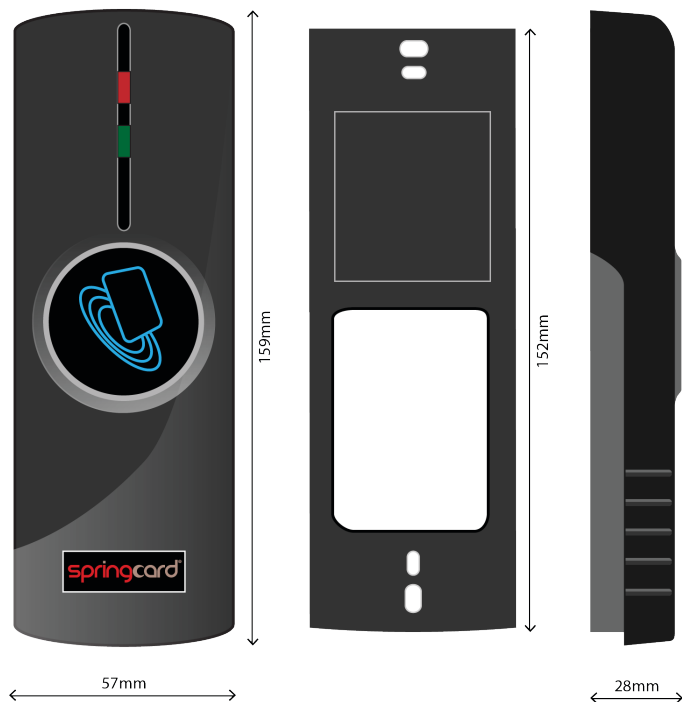


# Technical data

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	FunkyGate-IP NFC	FunkyGate-IP+POE NFC	FunkyGate-DW NFC
			
<b>RFID/NFC Standards</b>	ISO 14443 A-B, ISO 15693, NFC peer-to-peer (ISO 18092 initiator, passive communication mode)		
Carrier frequency	13.56MHz (RFID HF)		
RF field level	Typ. 2.5A/m at 0.5cm		
Operating distance	Typ.: 0.5-3cm, up to 5cm (depends on card/tag)		
Card/tag baudrate	26kbps (ISO 15693), 106kbps (ISO 14443), 212kbps (ISO 18092)		
<b>Communication ports</b>	RJ45 Ethernet 10/100 T	RJ45 Ethernet 10/100 T supporting POE	6-pin screw terminal RS-485 Dataclock or Wiegand LED (red/green) input lines
<b>Power</b>	2-pin screw terminal 9-24V DC input (120mA typ., 200mA max @ 12V)	2-pin screw terminal 9-24V DC input (120mA typ., 200mA max @ 12V) or POE 802.3af class I	2-pin screw terminal 9-24V DC input (100mA typ., 160mA max @ 12V)
<b>Visual</b>	2 LEDs driven by the host (red/green) + blue backlight behind the round at the center		
<b>Sound</b>	Single tone beeper		
<b>Dimensions</b>	Size: 157 x 57 x 29mm / Weight: 240g		
<b>Environment</b>	Indoor use / Outdoor under roof only		
Temperature	Operating: -20°C – +70°C / Storage: -40°C – +85°C		
Humidity	0 – 90% (non condensing)		
MTBF	500 000 hours		
<b>Approvals</b>	EN50082, EN55022 classB, CE mark – FCC class B part 15 (pending/on request)		
Environmental	RoHS, REACH, WEEE		
<b>Warranty</b>	2 years		

# Dimensions & wiring

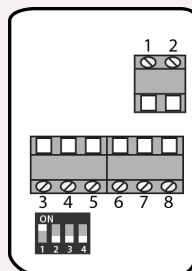


#	
1	VCC - 12V
2	GND - masse

## Recommended cable

- Ethernet cat. 5 - 100m max. between the reader and the switch or hub

Firmware upgrade is performed through the USB socket.



#	RS-485	Dataclock	Wiegand
1	VCC - 12V		
2	GND - ground		
3	RS-485 A	NC	NC
4	RS-485 B	NC	NC
5	NC	DATA	D0
6	NC	CLOCK	D1
7	NC	Red LED input	
8	NC	Green LED input	

## Recommended cable

- RS-485 : 2 x twisted pair, screened, 22AWG, 150m max. at 9600bps, 30m max. at 38400bps, max. 32 nodes per segment (use a repeater for a larger number of nodes)
- Dataclock and Wiegand : 3 x twisted pairs, shielded, 22AWG, 150m max. between the reader and the controller.

The section of the wires must be chosen according to the length and the power requirement (peak current) in order to avoid any voltage drop.

The role of configuration switches is detailed in the manual of each reader. The readers also have a 'reset' push button (not depicted in the drawings).

## YOUR EXPERT IN SMARTCARDS, RFID AND NFC

SpringCard offers a wide range of products to meet as many as possible of needs and use cases.

With a 14-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.

Paris – Angers – San Diego – Tokyo – Sydney



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