GemTAG – cx21

Contactless Smart Card Reader/Writer

PRODUCT SPECIFICATION and DATA SHEET

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Product Specification
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1. General Information

Scope

This document describes the basic functionality and the electric specifications of the UK manufactured GemTAG cx21 reader.

This dual interface reader is designed for OEM as well as being a desktop device. The reader was specifically aimed towards industrial and office applications where high performance and sleek appearance are essential.

General Description

GemTAG cx21 is a dual interface reader based on the RC663 NFC reader IC and NXP ARM microcontroller. RC663 NFC is a family member of the highly integrated reader ICs for contactless communications over a frequency of 13.56 MHz.
All layers of ISO 7816, ISO 14443A+B, and MIFARE® are supported.

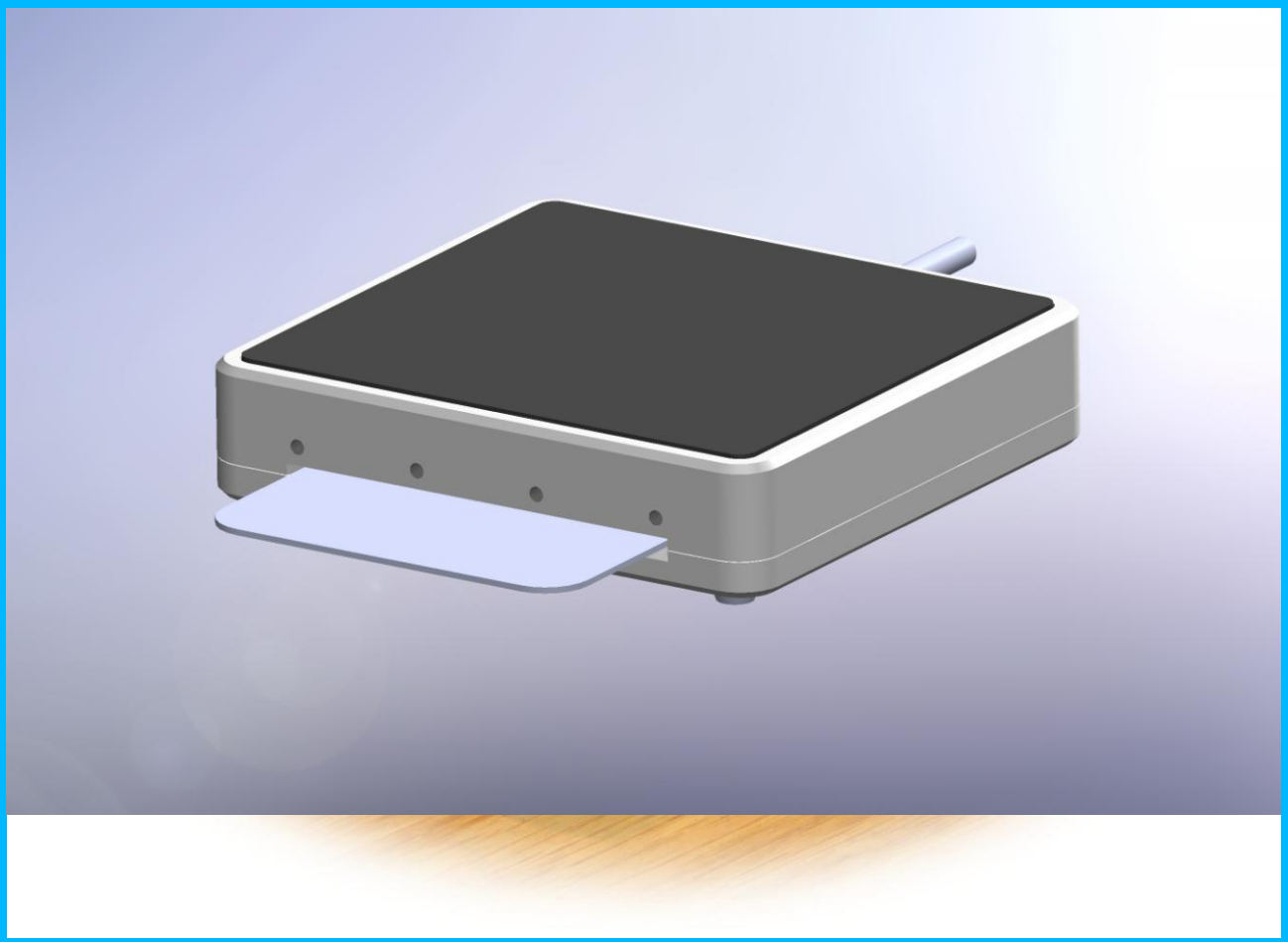

Fig. 1

Features

- Dual interface smart card reader
- Based on RC663 NFC reader IC
- 32 bit ARM controller
- Contactless operating frequency 13.56 MHz
- Supports ISO 14443A part 1-4
- Supports ISO 14443B
- Supports MIFARE® Classic crypto
- External coax or direct aerial connector
- Typical Operating Instance: 40 – 60 mm
- 2 x ISO7816 interfaces
- Host USB 1.1 and 2.0 Full Speed Compliant, 1.85m USB sealed lead
- Host RS232 interface
- Host SPI interface
- Power supply via the USB (or external 5 VDC)
- 4 LED indicators (software controlled)
- Beeper
- CCID compliant
- Windows 2K, Server 2003/8, XP (32/64), Vista (32/64), Windows 7(32/64), Windows CE (mobile) compatible
- Mac OS X compatible
- Linux compatible (all major distributions)
- CE and FCC compliant
- EMV level 1 compliant
- ITSO compliant
- NFC reader compliant

Ordering Information

Packaged version: GemTAG cx21-B– Charcoal black

Packaged version: GemTAG cx21-W – Pure white

OEM version: GemTAG cx21-OEM

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2. Electrical Characteristics

Operating Condition Range

Relative humidity: up to 93%, non condensing

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T_{op}	Operation Temperature	-	-20	25	70	C
T_{str}	Storage Temperature	-	-30	25	80	C
Vcc	DC Supply Voltage	-	4.5	5	5.5	V

Table 1 - Operating Condition Range

Current Consumption

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{VCC}	Supply Current	1 ISO 7816 card, 1 Mifare card	-	130	-	mA

Table 2 - Current Consumption

Operating Distance

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
OD	Operating Distance (Typical Mifare 1K)	Measured from the reader surface	40	50	60	mm

Table 3 - Operating Distance

Interface Characteristics

GemTAG cx21 is interfaced to a USB host via the provided USB cable which is USB 1.1 and 2.0 compatible. CCID firmware or proprietary G2K API is available.

SPI and Serial RS232 interfaces are available for OEM.

3. Operating Conditions and Standards

The GemTAG cx21 fulfills the following requirements for electromagnetic compatibility:

- FCC
- CE

4. Mechanical Specifications

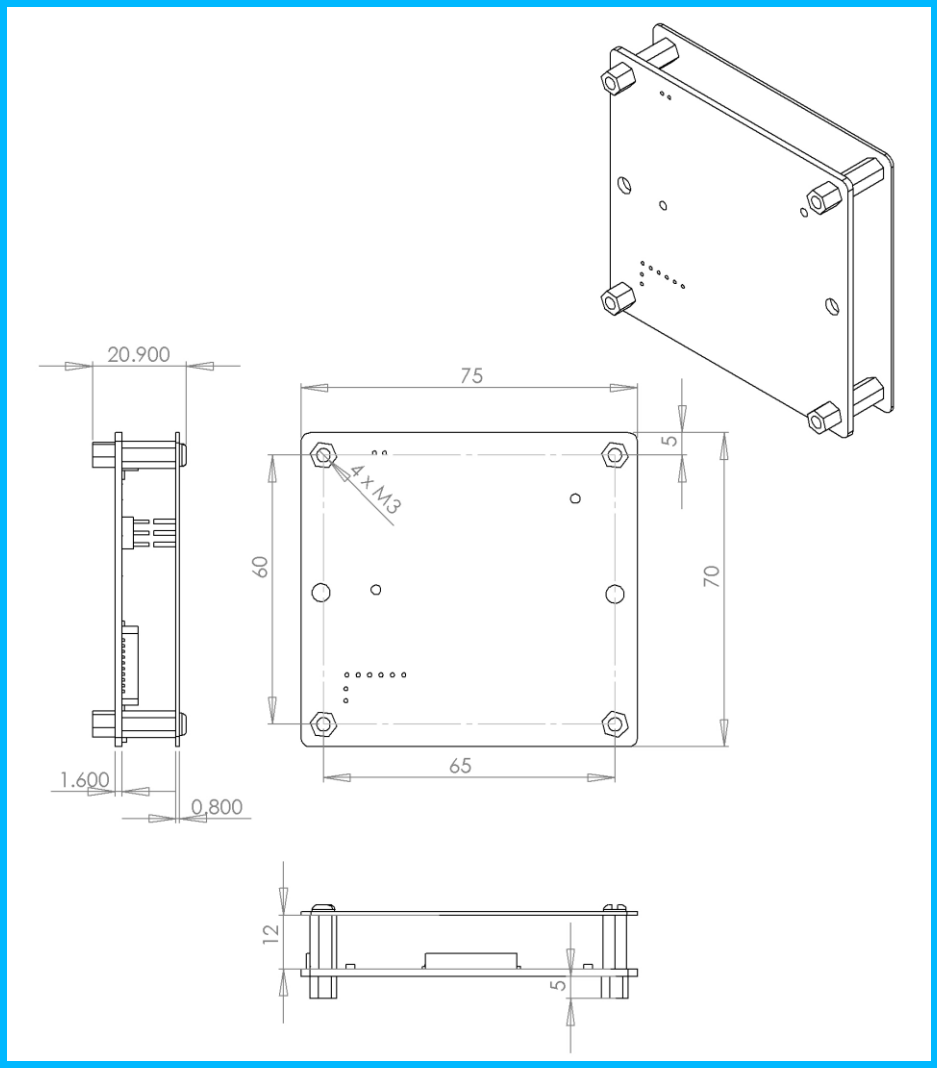

Fig. 2

OEM main board

- Length – 75.0 mm
- Width - 70.0 mm
- Height – 6.5 mm
- PCB thickness – 1.6mm

Boxed

- Length – 82.0 mm
- Width - 77.0 mm
- Height - 20.0 mm

5. Connectors

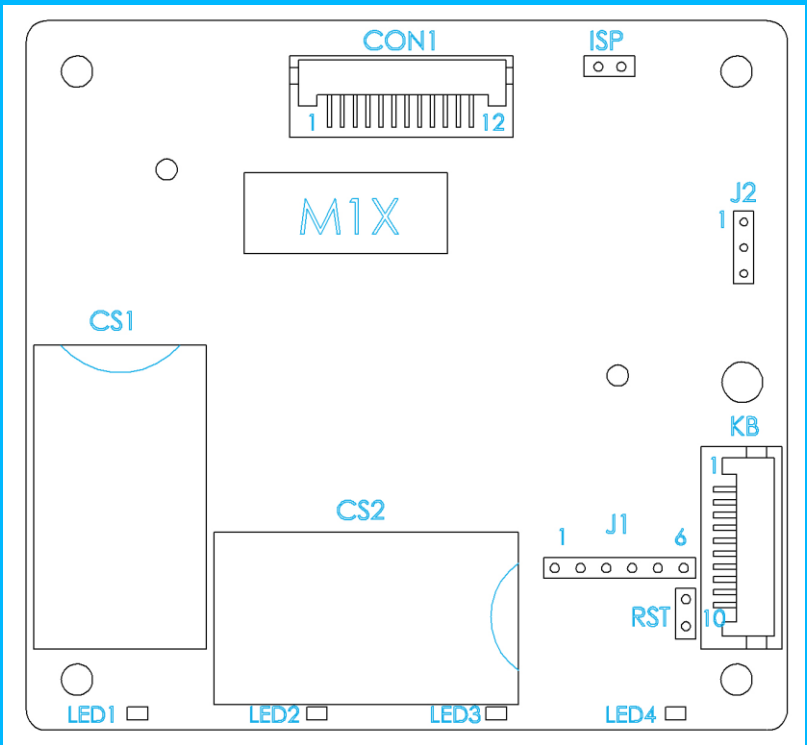

Fig 3. Connector Locations

CON1

Pin No.	Function	Comment	Levels
1	POW	Main power +5V	+5V
2	H_USB_D-/GPI02	USB Input/generic IO	+5V
3	H USB D+/GPI01	USB Input/generic IO	+5V
4	GND	Ground	0V
5	RS232 RxD	Serial Input	+/-5V or +3.3/5V
6	RS232 TxD	Serial Output	+/-5V or +3.3V
7	MOSI1	SPI/ generic IO	+3.3/5V
8	MISO1	SPI/ generic IO	+3.3/5V
9	SCK1	SPI/ generic IO	+3.3/5V
10	SSEL1/IAP	SPI/ generic IO	+3.3/5V
11	ISP/RC663 INT	ISP Mode Select	+3.3/5V
12	RSTB	Reset	+3.3/5V

Header: IL-Z-12PL-SMTYE (FARNELL 9650881) Manufacturer: JAE
Housing: IL-Z-125-S125 (FARNELL 5098838) Manufacturer: JAE
Crimp Socket: IL-Z-C3-A-15000 (FARNELL 1107603) Manufacturer: JAE
Crimp Tool: CT150-4C-ILZ (FARNELL 3887571) Manufacturer: JAE

ISP

Pin No.	Function	Comment	Level
1	GND	Ground	0V

2	ISP	ISP Mode Select	+3.3/5V

KB

Pin No.	Function	Comment	Level
1	VDD3V3_MCU	Power out	+3.3V
2	KB ROW0	Keypad/generic IO	+3.3/5V
3	KB ROW1	Keypad/generic IO	+3.3/5V
4	KB ROW2	Keypad/generic IO	+3.3/5V
5	KB ROW3	Keypad/generic IO	+3.3/5V
6	KB COL0	Keypad/generic IO	+3.3/5V
7	KB COL1	Keypad/generic IO	+3.3/5V
8	KB COL2	Keypad/generic IO	+3.3/5V
9	KB_COL3	Keypad/generic IO	+3.3/5V
10	GND	Ground	0V

Header: IL-Z-10PL-SMTYE (FARNELL 9650873) Manufacturer: JAE
Housing: IL-Z-105-S125 (FARNELL 1107597) Manufacturer: JAE
Crimp Socket: IL-Z-C3-A-15000 (FARNELL 1107603) Manufacturer: JAE
Crimp Tool: CT150-4C-ILZ (FARNELL 3887571) Manufacturer: JAE

J2

Pin No.	Function	Comment	Level
1	Tx+	RF Transmit +	+5V
2	GND	Ground	0V
3	Tx-	RF Transmit -	+5V

J1

Pin No.	Function	Comment	Level
1	TDO	JTAG	+3.3V
2	TDI	JTAG	+3.3V
3	TMS	JTAG	+3.3V
4	TRST	JTAG	+3.3V
5	TSK	JTAG	+3.3V
6	GND	Ground	0V

RST

Pin No.	Function	Comment	Level
1	GND	Ground	0V
2	RST	Reset	+3.3/5V

CS1
SIM/SAM Card Slot 1

CS2
SIM/SAM Card Slot 2

M1X
External LCD Connector

6. Contact Information

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7. Life Support Application

These products are not designed for use in life support appliances, devices or systems where malfunction of these products can reasonably be expected to result in personal injury. Gemini 2000 customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Gemini 2000 for any damages resulting from such improper use or sale.

NOTE: The FCC and CE certification are only valid when the USB cable is equipped with the shielding components.

8. Operating Conditions and Standards

The GemTAG – cx21 fulfills the following requirements for electromagnetic compatibility:

- FCC part 15
- CE

FCC warning statement:

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment