CRT-310-NU01 Motorized Card Reader Manual

V 1.0

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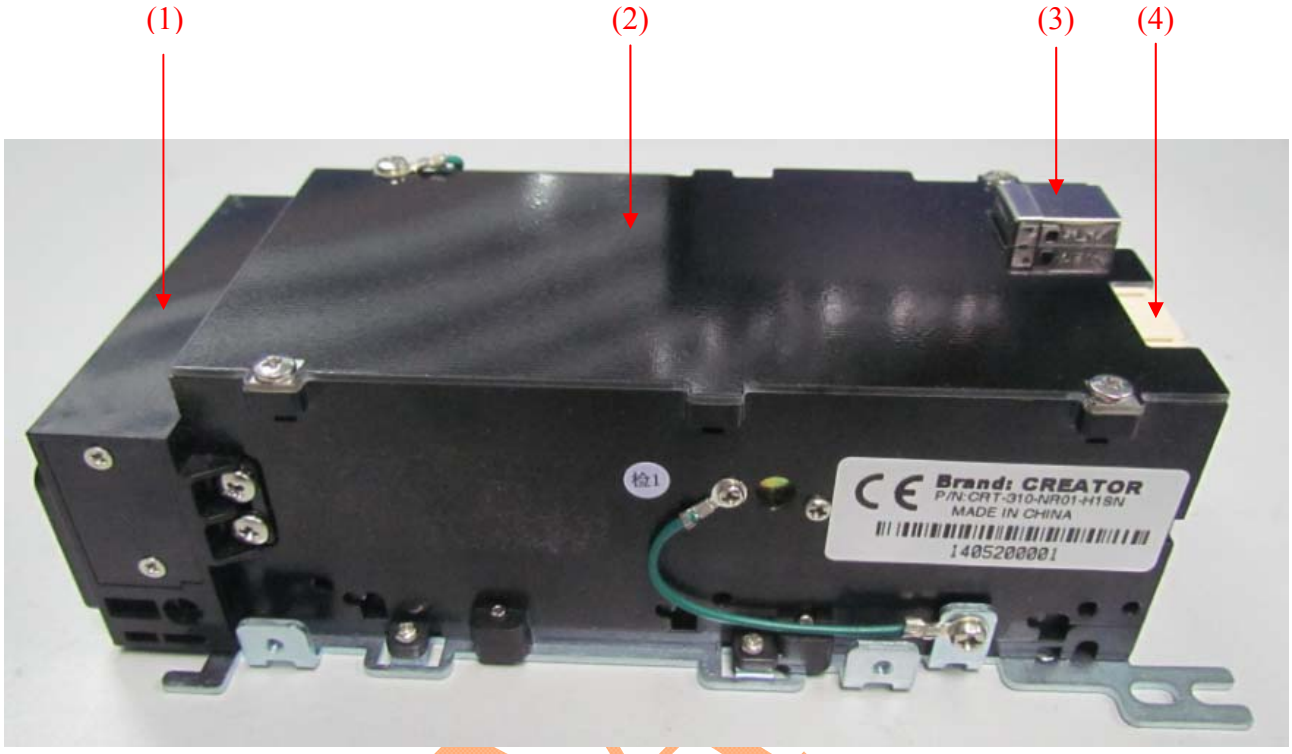
Revision record

Version	date	content
1.0	2014.11.05	First time release

- **Welcome to use Creator's product**
- **Please read the manual carefully before you use our product**

Basic component:



1----------Bezel (optional)

2----------Pulley and card read parts

3----------RS-232 communication interface connector

4----------4PIN interface connector of power supply

Warn ： Morn than 15V is prohibited， it may cause reader damaged！！

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1. Summary

CRT-310-NU01 is a motorized card reader with card captured/ ejected and 3-card in one function.

Product main feature：:

1） 3-card in one：Mag-card read, IC card read & write, contactless IC card read & write；

2） Electromagnetic controlled shutter, the commands support Mag/switch controlled open；

3） Motorized card captured and ejected with the function of card retrieved at rear end；

4） Compact motorized card reader，Mounting dimensions and card mouth height size please refer to the instructions in the appendix the size chart；

5） Communication protocol specification meet financial self-service equipment card reader standard, please refer to the product of communication protocol；

6） Contactless IC card reading and writing, support Type A, Type B CPU；

7） High reliability and durability；

8） CE and EMC certification；

9） Power monitoring and power down protected；

10） PBOC3.0 and EMV4.1 certified（contact IC card）；

11） ICRW life: at least 600,000 cycles（one cycle is card in and out）；

12） Optional parts： PSAM board.

2. Specification

1) With functions of Magnetic stripe card read, contact & contactless card read & write, the cards should be compliant of related standard，refer to technical parameters.

2) With the functions of automatically card captured, controlling of in/out/retrieved.

3) Both front & rear insertion of card, move and clear broken card in reader.

4) USB interface

5) With multi-function of fault tolerant and special maintenance including process of abnormal cards and power down etc.

3. Technical Parameter

1) Power supply	DC 12V±5%
2) Current consumption	Idle current： less than 150 mA
	Peak current： less than 1500 mA
3) Speed	Around 270mm/s
4) Interface	USB2.0，HID1.11
5) Card specification	Width:53.92～54.18 mm， Length：85.47～85.90 mm
	Thickness: 0.6mm～1.1mm（ex-work:0.8mm）

6) Net Mass Approximately 410g（not including accessories and package）

7) Amount dimension Refer to structure outline drawing

8) Performance of reading Mag-Card Pass the test of the standard/Q card（TC-JI 15% BB 30%SI，TC-A 30% weaken Mag-Card）

9) Reliability A. Vibration： frequency： 5～50Hz; Acceleration：2m/s^2（0.2G）; direction and time： X，Y，Z directions, each 15 minutes； amplitude：2mm; no functional failure at A

B. Shock： 294m/s^2（30G），11ms， each of X，Y，Z directions once，no functional failure at B（ICRW without package）

10) Life Transport：1000,000 pass Min（one card pass is a forward and a reverse）

Magnetic head：read card 1,000,000 times Min

Downward press device and contact for IC card：500,000 on/off Min

11) Power down mode voltage≤10V，time≥50 ms

12) Error rate Mag-card：normal condition (15～25℃，35～60%RH)，less than 1 time per 1,000 times reading standard card； note: standard card except man made error.

IC card：less than once error per 1,000 times，（except Q card）.

note：above IC cards are standard card

Contactless IC card: reading & writing error less than once per 10,000 times ,--note：Standard card

13) Warped card Average abnormal height is less than 2mm

14) MTBF More than 100,000 hours（only electric components）

note：250 times/day，25 days/Month，300 hours/Month

15) Environment operation: 0℃～50℃， 0～90% RH (no condensing)

storage: -25℃～80℃， 0～95% RH (no condensing)

normal condition：15～25℃，35～60%RH

16）On-line download support IAP on-line download

17）RoHS standard RoHS standard compliant

18）IC card standard ISO7816-1，2，3，4/EMV 4.1 L1/PBOC 3.0 L1

（AT24C01、24C02、……、24C256; SLE4442、SLE4428; CPU T=0/T=1）

19）Contactless IC card ISO14443-3 (Mifare one： S50、S70、UL etc)

ISO14443-4（TYPE A CPU： mifare plus， mifare desfire etc）

（TYPE B CPU）

20）Magnetic stripe card standard

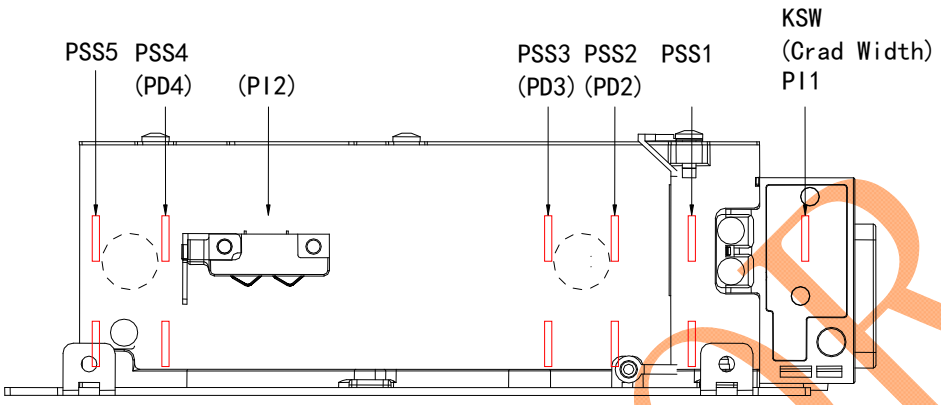
Physical feather: ISO7810 and 7811

Card dimension: ISO7810ID-1-magnetic stripe card standard

Embossed card：ISO7811-1 and ISO7811-3

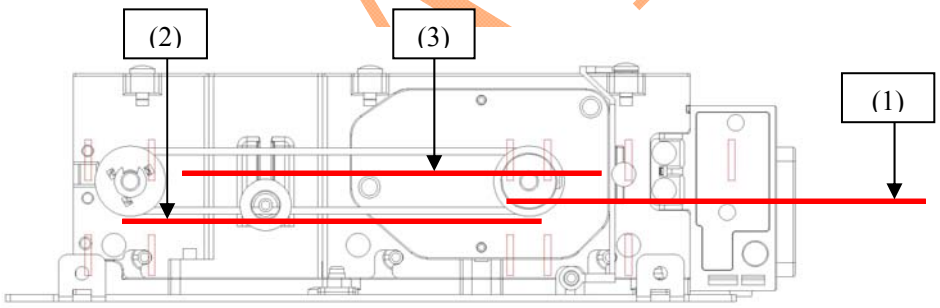
Record format：ISO7811-2、ISO7811-4、ISO7811-5 and ISO7811-6 standard

4. Sensor location instruction：



5. Card moving status：

1. The card holding position at front side
2. Inner position
3. IC card operation position



6. Operation mode

6.1 Card insertion of activities：

1) ICRW automatically reads the magnetic stripe card after the card enters in，then moves the card to the inner specific position；

2）ICRW moves the card to the inner specific position after the card entries from rear terminal.

6.2 Read magnetic stripe card：

ICRW automatically reads the magnetic stripe card after the card enters in，save the data in RAM，waiting to upload the data after receiving the relevant command；

6.3 Read IC card：moving to IC card operation position，and begin to operate after successfully move（including auto-test card type）.

6.4 Read contactless IC card: the card staying in ICRW at IC card operation position, RF operation is allowed at this moment.

6.5 Abnormal cards handling：

1）Abnormal cards means that the size and shape are different from ISO standard cards；

2）ICRW automatically removes the card to the front of entrance if it judges the card is abnormal as the card enters into the machine；

3）Recharging of abnormal card，if ICRW checks the abnormal card existed，there are 2 ways to handle as following:

① For the long length card，executing reset command，ICRW removes the card to the front；

② For the shorter card，nowhere the card is in machine or at front entrance，executing reset command“ejecting the card backwards”，meantime to insert a normal card , ICRW will discharge them together backwards.

6.6 Power down handling：

1）The power cable is combined with 4- wire（red-yellow-2 black），12V-red/yellow，GND-black，the yellow-black in middle set is prepared for backup power supply，connecting to back-up capacitor for card ejecting when power down；

2）Once main power down，there is a backup power for preparing work，the ICRW will start to run its power down mode after 1 second，if the card is inside of the ICRW, eject card or not decided by set of PD parameter; ICRW responses negative to any command before the power supply recovered（error word“power down protected state”）；

3）If the main power is recovered (≥11V)，the ICRW returns to previous state (before power down) by executing reset command.

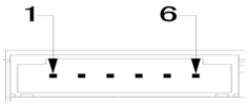
6.7 Error handling

Once ICRW occupied with the error of blocks，it’s necessary to clear the error sign by sending the reset

command, after that it's possible to execute other commands.(The details referred to protocol)

7. Power cable and Communication cable connection method

(1) Power interface



Power socket use JST connector,

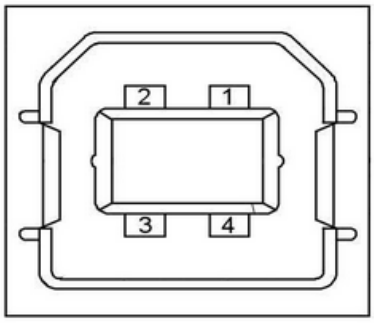
Power socket: S6B-PH-SM4-TB connection terminals: PHR-6

6pin power interface definition:

PIN No.	definition	instruction
1	GND	Power input GND
2	GND	Power input GND
3	+12V	Input +12V
4	+12V	Input +12V
5	+12VB	Backup input +12V
6	GNDB	Backup input +12V

(2) USB interface

USB interface is a standard USB B type socket:

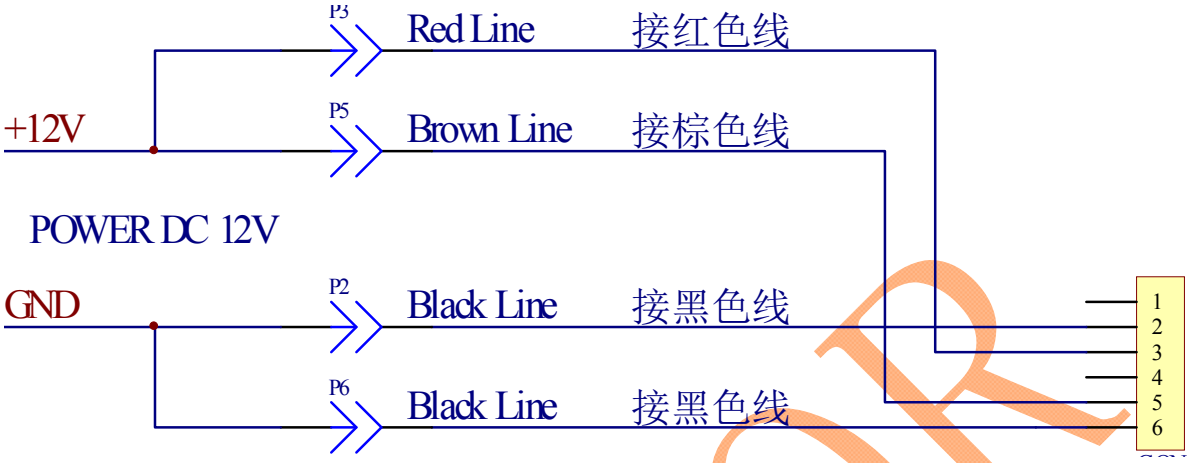


PIN No.	definition	instruction
1	VBUS	USB power
2	D-	Signal cable
3	D+	Signal cable
4	GND	GND

(3) CRT-310-NU01 has two ways of connection：

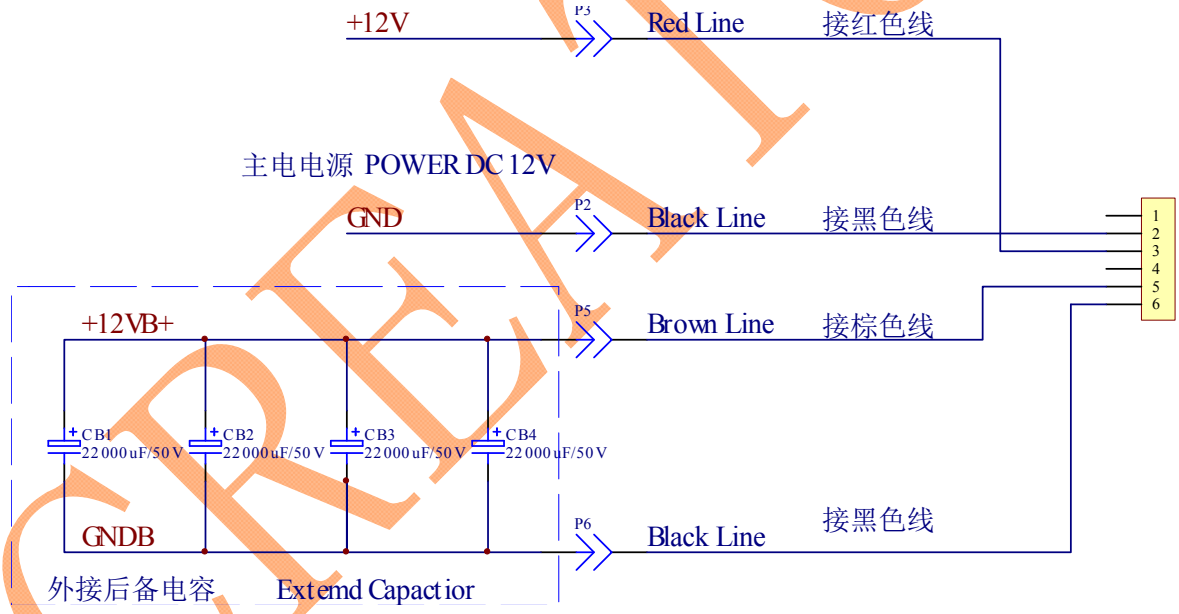
1） Single main power connection（as below picture）

Red brown cable to +12V，black cable to GND



2） Main power + backup power connection for power down ejecting（as below picture）

Red cable to +12V，black cable to GND，brown to backup + ，black to backup -



8. Preventive and Maintenance

The reader should be maintained after the appropriate interval of use:

1） When the transportation roller is dirt, please use cleaning card with alcohol

2） Dip the cleaning card into alcohol and execute card transportation command to clean the internal area.

3） Periodic maintenance:

For sensor, magnetic head and IC contact, suggest a maintenance every 2,000 times

① Sensor maintenance: Connect reader first and operate DEMO to query & check sensor status. In the initial status (No card inside), the all status of sensor are “OFF”, and if there is a sensor status show as ”ON”, the maintenance of this sensor group is needed.

② IC contact maintenance: If any dirt is founded on the IC contact, please use cleaning card with alcohol to clean. Use method: After insert cleaning card, please execute auto test card type function to clean the IC contact.

③ Roller maintenance: Use card transportation command and cleaning card.

④ Magnetic head maintenance: Use card transportation command and cleaning card

9. Cautions for use

1）Cut the power for ICRW before start to repair

2）Prohibit to plug out serial port in electrified condition.

3）Grease contamination is prohibited

4）Suggest DC12V/3A power supply. Prohibit to access to power surpass 15V

5）Plug out power first than serial port

6）Insertion direction for IC card: See the following picture. Shown as following (Picture 4)

Picture 4 IC card entry direction

7）Insertion direction for Magnetic card: Magnetic strip is on the right side of reader; please refer to the following picture 5

Picture 5 Magnetic stripe card entry direction

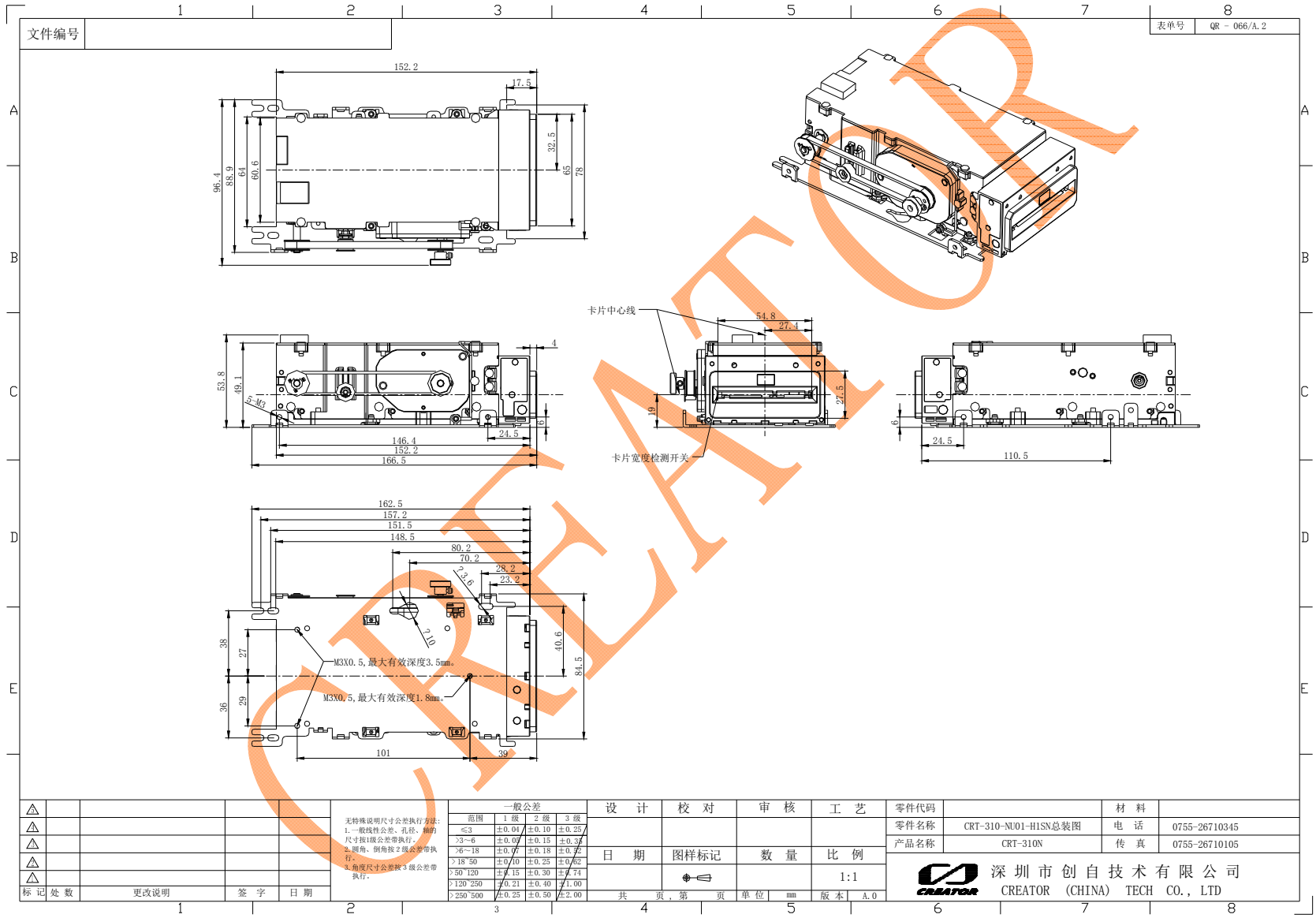
10. CRT-310-NU01 mode and function instruction

Product mode	Power supply	Communication interface	Mag-stripe reading (track 1,2, 3)	Contact IC card read/write			Contactless IC card R/W		SAM card R/W
				Memory 卡 SLE4442/4428 AT24CXX	CPU 卡 (T=0/T=1)	EMV /PBOC	Mifare one (S50,S70, UL)	Type A/B	T=0/T=1 VCC=5V/3V/1.8V
CRT-310-NU01-H1SN	12V	USB	support	support	support	support	support	support	none

note：

1. “none” no support
2. The related mode installation method and mounting holes in this chard, see structure drawing
3. The details about functions and protocols, please read the《CRT-310-NU01 card reader communication protocol .pdf》

11. Structure and outline drawings



标记	处数	更改说明	签字	日期
△1				
△2				
△3				
△4				
△5				

无特殊说明尺寸公差执行方法：
1.一般线性公差、孔径、轴的尺寸按1级公差带执行。
2.圆角、倒角按2级公差带执行。
3.角度尺寸公差按3级公差带执行。

一般公差

范围	1级	2级	3级
≤3	±0.04	±0.10	±0.25
>3~6	±0.05	±0.15	±0.35
>6~18	±0.06	±0.18	±0.42
>18~50	±0.10	±0.25	±0.62
>50~120	±0.15	±0.30	±0.74
>120~250	±0.21	±0.40	±1.00
>250~500	±0.25	±0.50	±2.00

设计	校对	审核	工艺	零件代码		材料	
				零件名称	CRT-310-NU01-H1SN总装图	电话	0755-26710345
日期	图样标记	数量	比例	产品名称	CRT-310N	传真	0755-26710105
			1:1	深圳市创自技术有限公司 CREATOR (CHINA) TECH CO., LTD			
共 页，第 页		单位 mm	版本 A.0				