CONTENT
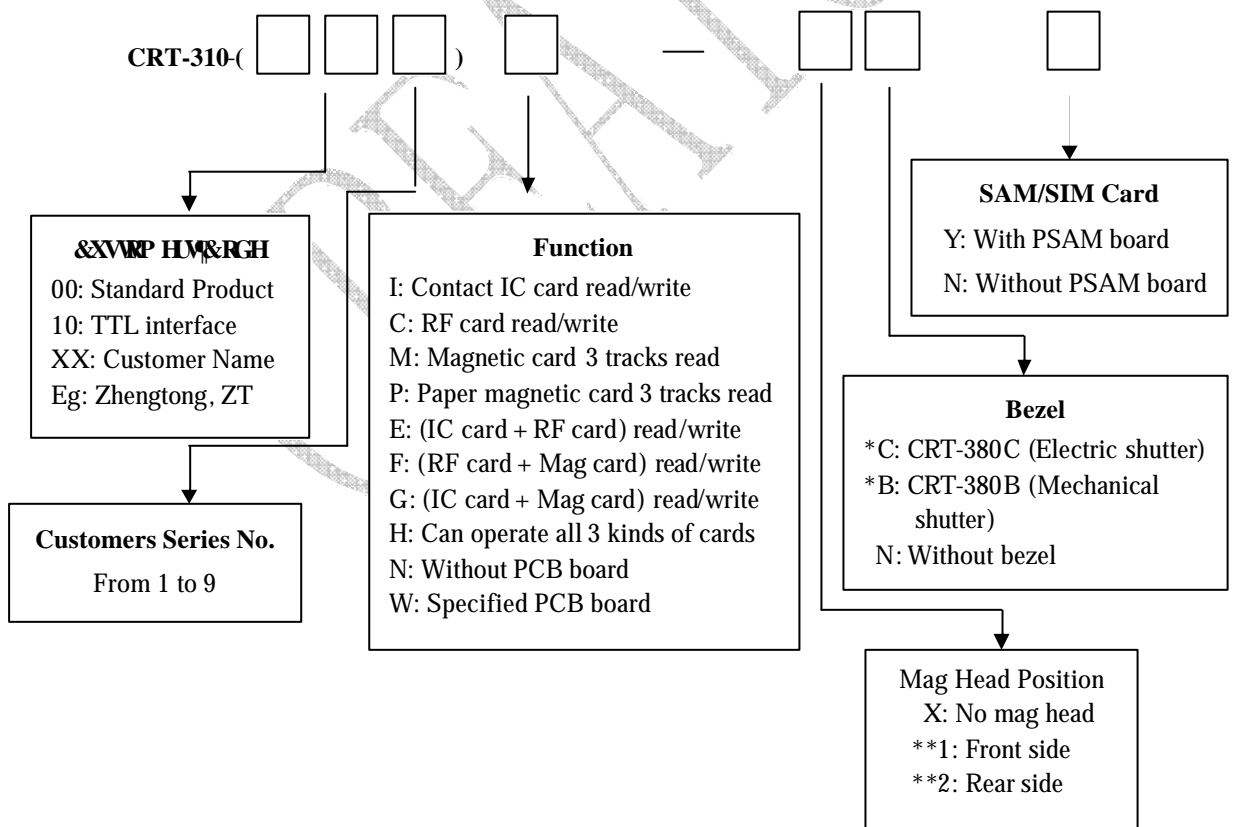
1. General View

CRT-310 V3 is a series of motor card reader/writer of Magnetic/IC/RF card equipments, with function of "Motor front inserting/ejecting function"

Main features:

- 3 in one: IC card, magnetic card and RF card read/write, the three features can be used alone or simultaneously;
- Auto card insertion/ejection: Auto insertion, card in, out or captured can be controlled;
- Multiplied card transportation: Insert and eject the card from both front and rear side, card move in the reader, clear up the disabled card;
- Two kind bezel option: Mechanical and electric shutter option;
- Options: The special eject card subassembly; Power off protect; DC 24V to 12V transfer board; PSAM board;
- Multi-functions: Deal with abnormal cards, power off, special maintains occasions
- Multi-communication Protocols: Compatible with several other brand products protocols;
- Durability: Each component with over 500,000 cycles durability;
- Customized service

2. Model Specification

CRT-310-(☐☐☐) ☐ — ☐☐ ☐

Custom est Code
00: Standard Product
10: TTL interface
XX: Customer Name
Eg: Zhengtong, ZT

Customers Series No.
From 1 to 9

Function
I: Contact IC card read/write
C: RF card read/write
M: Magnetic card 3 tracks read
P: Paper magnetic card 3 tracks read
E: (IC card + RF card) read/write
F: (RF card + Mag card) read/write
G: (IC card + Mag card) read/write
H: Can operate all 3 kinds of cards
N: Without PCB board
W: Specified PCB board

SAM/SIM Card
Y: With PSAM board
N: Without PSAM board

Bezel
*C: CRT-380C (Electric shutter)
*B: CRT-380B (Mechanical shutter)
N: Without bezel

Mag Head Position
X: No mag head
**1: Front side
**2: Rear side

Note:

**: Instruction of Mag Head Position:

1) In order to be compatible with other brand products, the CRT-310 mag head has two positions as options. And each position has their own advantages.

2) Mag head in front side can allow card in from the rear side, but it can not read the magnetic card.

3) Mag head in rear side can allow card in from the rear side, and can execute the magnetic operation several times (according to the special command), but it need more space for the reader.
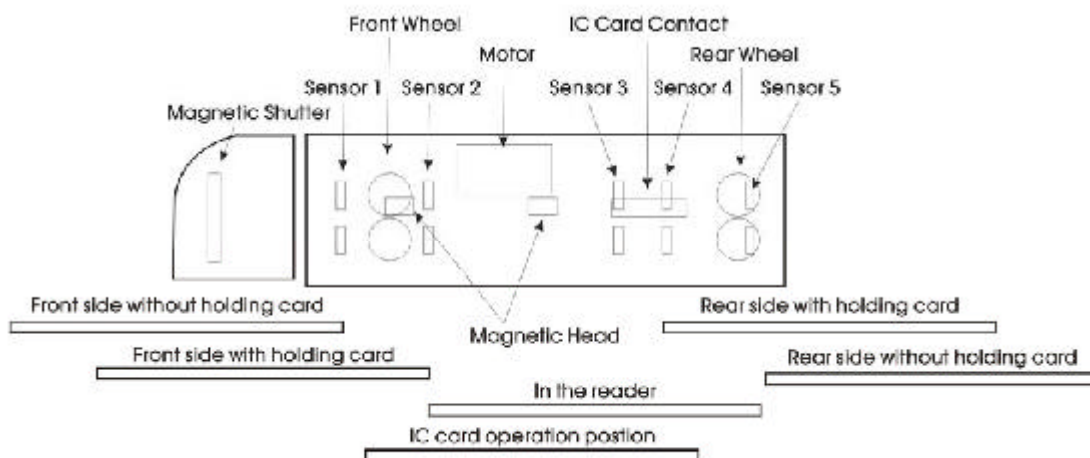
*: CRT-310 Bezel Options:

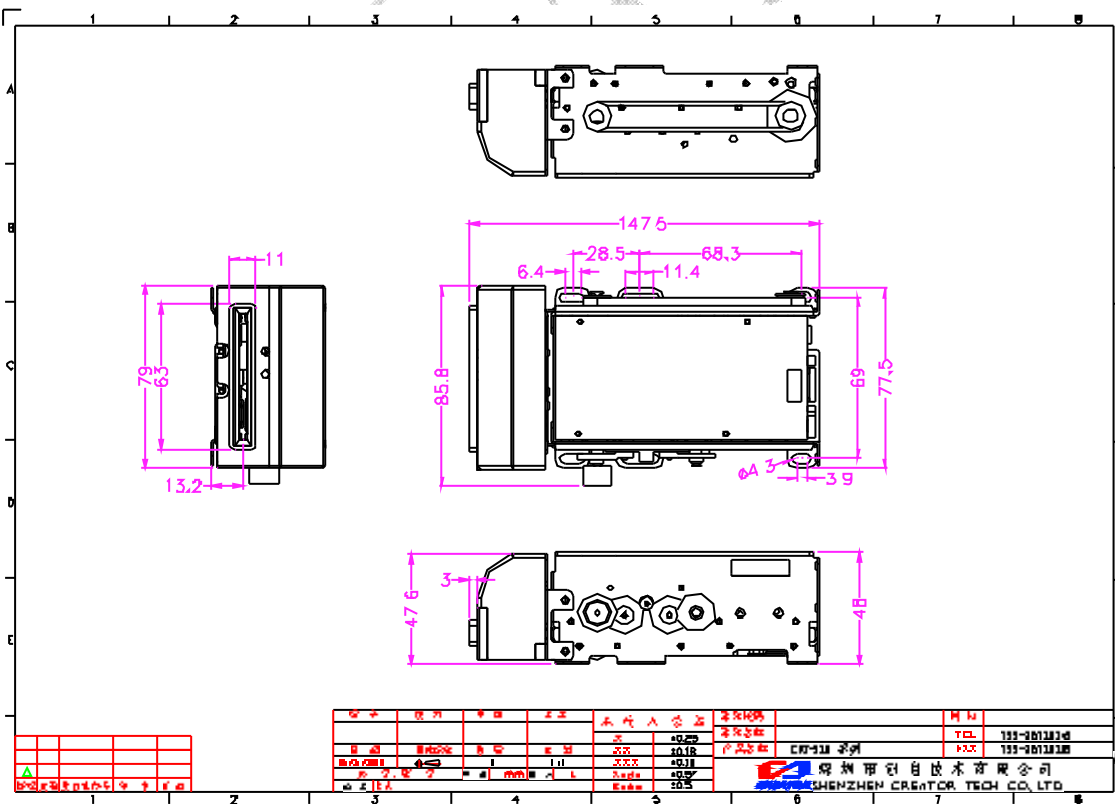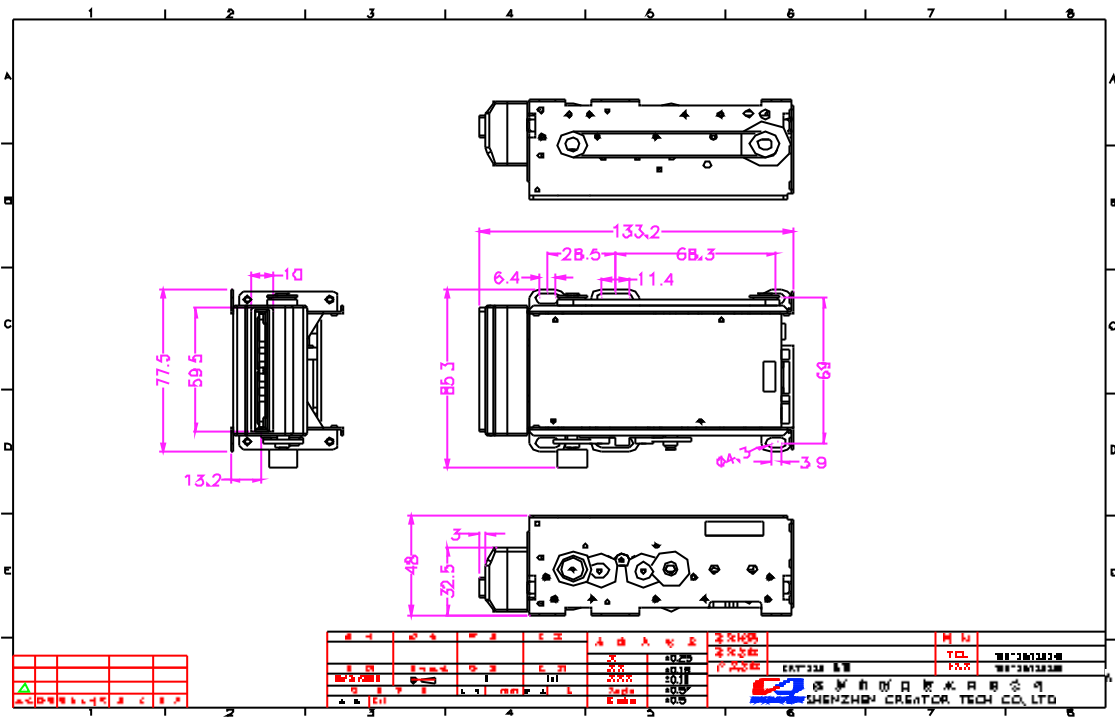CRT-380C   CRT-380B

❖❖❖❖❖ Available accessories

DC24V/DC12V transfer board   CRT-301A

Power-off protection broad   CRT-302A

PSAM board（with 8 SAM card connectors）   CRT-303A

3. Structure and Card Stop Position

4. Structure and Dimensional Drawing

5. Card Type

5.1 Magnetic Card Standard

(1) Physical characteristics: Accordance with ISO7810, ISO7811

(2) Card dimensions: Accordance with ISO ISO7810ID-1- type card

(3) Embossing: Accordance with ISO7811-1, -3

(4) Recording format: Accordance with ISO7811-2, -4, -5, -6

(5) Recordable capacity: Track 1 (IATA): 79 characters max (6 bit+1 parity)

Track 2 (ABA): 40 characters max (4 bit+1 parity)

Track 3 (MINTS): 107 characters max (4 bit+1 parity)

(6) Recording method: Two Frequency Coherent Phase Recording

(7) Allowance of card warp: 2mm max.

(8) Coercive force: 24k~320k A/m (300~4000 Oe) +/-10%

(9) Reading capability (ex-work standard): Can read Q card (TC-JS, TC-JT, JC-JI, TC-A) and 30% magnetic card with weak magnetism.

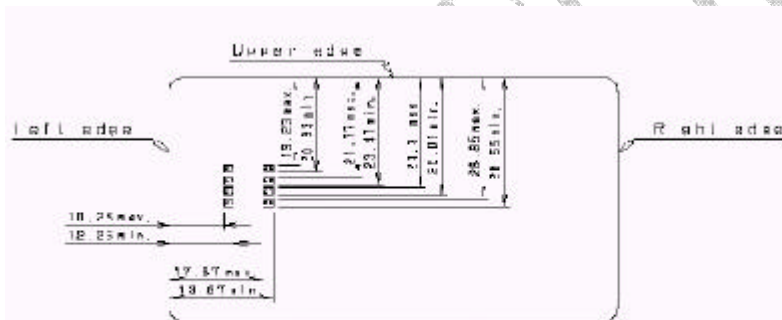### 5.2 Contact IC Card (ISO7816-2)
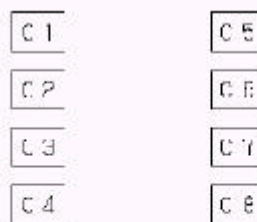

Figure 1-Contacts location

Figure 2-Assignment of the Contacts

5.3 Contactless IC Card, Mifare Type A

Mifare 1 S50/S70 (Philips Company production) is in accordance with ISO14443 International Standard and support contactless card.

NOTE: Mifare 1 S50 has 16 sectors and S70 has 32 sectors, and each has its own independent operation password.

SPECIFICATION	
Standard	ISO/14443-A
Operation Frequency	13.56HMz
Effective Operation Distance	90mm (Naked Board)
Key memory	NVRAM
Communication Speed	105k bps
9ROMH'&9 ?	
Operation Temperature	0℃－50℃
Storage Temperature	-20℃－70℃
Operation Humidity	0－90%(non-condensing)

5.4 Abnormal card

A. Card thickness： ±ＰＰ

If the thickness between 0.2mm-0.6mm and 1.0mm-1.2mm, the probability of failure of card movement will double. Please state your special requirement when your place an order.

B．Card Shape：Meet Standard，Flawless

Please not a card with hole or a defective card could lead to card movement failure.

C．When an abnormal card enter the card reader, it will be ejected automatically.

6. Operation Environment

6.1 IC Card Contacts Module

(1) Landing contacts;
(2) Number of contacts: 8PIN;
(3) Material of contacts/plating, beryllium copper/Gold over nickel (gilt thickness: 40u min.);
(4) Use FPC output directly (TTL).

6.2 Card Carrying System

(1) Power source   : DC motor
(2) Card carrying mechanism   : Gear wheels and belts
(3) Card insertion/ejection direction : Front and rear side ejection
(4) Card carrying speed   : 80cm/s
(5) Card location director   : 5 groups of sensor
                                        Note: Sometimes can not detect high transparent card for the infrared rays can go through it.
(6) Noise   : ≦80dB

6.3 Main Body Structure

(1) Main body: PC+20%GF 94V-2;

(2) Fixed bracket, Cold rolling board chromeplated, passed 96 h Salt Spray test

(3) Insulation resistance ≥10M ohm min, DC500V

(4) Weight: About 410g

6.4 Operation Condition

Operation temperature/humidity: 0℃²   ℃   non condensing

Storage temperature/humidity: -20℃²   ℃   non condensing

6.5 Voltage and Current

(1) Working voltage: 9   ?

(2) Static current: 50mA

(3) Max peak current value: 1.5A

6.6 Reliability/Durability

A. Vibration: No defect in all items of the characters under normal condition after exposed 15min.each on X, Y and Z directions of 2mm amplitude, from 10 to 50Hz/min vibrate.

B. Shock: No defect in all items of the characteristics under normal condition after shocked one time on X, Y and Z directions of $294M/S^2$, 11ms peak acceleration shock.

Normal condition: 20+/-5℃, 35~60%RH. The durability is based on the test environment.

6.7 Communication Wire Connect Instruction

HOST DB9 — RXD ②, TXD ③, GND ⑤

CRT-310 (Series) — RXD ②, TXD ①, GND ③
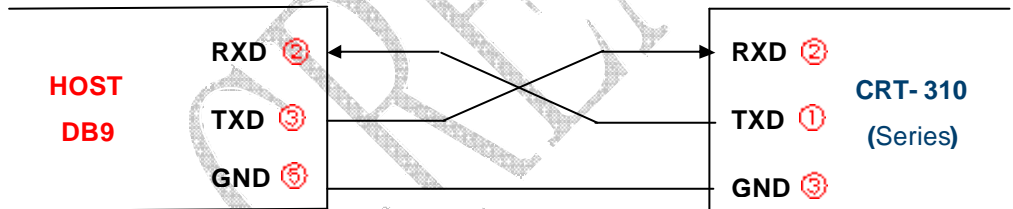
6.8 Power supply solution and wiring diagram

〈1〉Power supply：Recommend using DC12V/2A or above；if the voltage of the power supply is not in the range of 10.8V-14.5V〈Error? 9 〉, the card reader would not response to any operation except communication. And the red and green indicator light will twinkle；Responsing to all the communication, it shows the card reader is under protection mode.

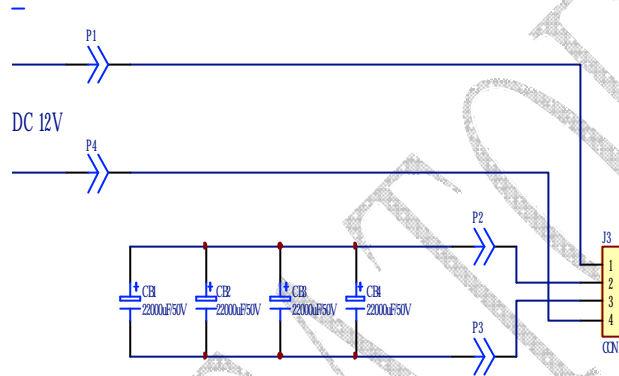**Notice: If the voltage could not meet the standard DV? will lead to the card movement failure.**

〔2〕 Single main power supply wiring diagram
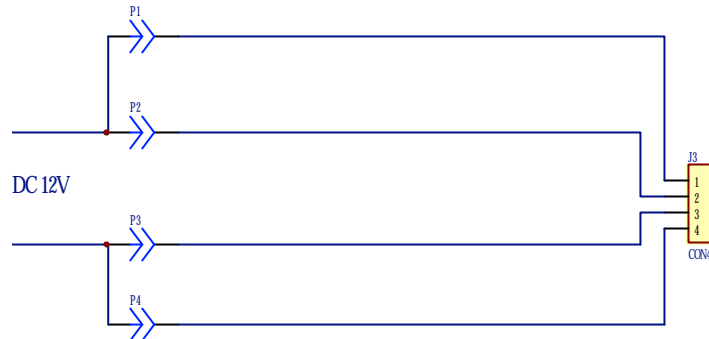
〔3〕 Main power supply & charging capacitor wiring diagram

Note：+12V　　　　P1(Red wire)　　P2〔Yellow wire〕

GND〔Ground lead〕　P3/P4〔Black wire〕

(4)The standard reader is using 12V power supply. And if you want DC 24V, you can request the DC24V/DC12V transfer board.

7．Operation Mode and Cautions

7.1 Card Movement

1) After the card in from front side, the reader will read the magnetic card automatically, and then go to the appointed card stop position.

2) After the card in from rear side, the reader will read the magnetic card automatically if the Mag head is in the rear of the card reader, or it will go to the appointed card stop position directly.

3) Without Mag head in the card reader, the card will go to the appointed card stop position directly whatever it is from the front side or rear side.

7.2 Magnetic Card Operation

(1) After the card in, the reader will read the magnetic card automatically, and then store the information into RAM, after receiving the command upload it.

(2) Only refer to CRT-310-X-2XX, it can send the re-read magnetic card command, so it will read again and then upload the information.

7.3 Contact IC Card Operation

Move the card to IC card operation position successfully, and then operate on the IC card (Including Auto test the card type command)

7.4 Contactless IC Card Operation

Card in the reader or at the IC card operation position can both operate the contactless IC card.

7.5 Deal with abnormal cards

(1) Abnormal card means the size of the card is different from the ISO standard cards.

(2) Abnormal card enter: When enters, the reader notice that the card is abnormal, it will eject the card out automatically.

(3) Abnormal card eject: If there is abnormal card in the reader, here are 3 ways to eject it out:

　a. Eject card from front: Use the eject card subassembly, use the button on it to eject the card out from front.

　b. Eject card from rear: Use "Eject abnormal card from rear side" reader will eject the card from rear immediately.

　c. To deal with the very short abnormal cards: whether there the card is at the gate or in the reader, use "Eject abnormal card from rear side" command and at the same time insert a standard card into the reader, the reader will eject both cards out automatically.

7.7 Deal with power off

　the are four power supply wires. One red one yellow two black. V+ red wire the main power supply, GND black wire at the other group, the two-black wires in the middle are for other power supply in support, it can connect with any other power supply, battery or other chargeable capacitance.

(2) Once the main power is off, the power supply in support will work, after 1 second (selectable, from 0 ~ 255 seconds), the reader will be in power off protect mode, if there is a card in the reader, it will be ejected out, and it will answer "Error" to any command to the reader, or in form at on is Power off protect mode.

(3) When the main power is on again, the reader will also be back to the normal mode.

8．Difference between V3.0 and V2.0

8.1 The part of the card outside the card reader is much longer when it stops at both the front side and the rear side with holding card position；

8.2 Could write a serial number to the card reader ；

8.3 Protection system will run when the operation voltage is out of natural range (10.8V-14.5V)；

8.4 Could operate any device with RS-232 serial port from third party to meet the customers' special requirement；

8.5 It completely conform to EMV standard；

8.6 Could read/write AT88SC1608 Card.

9. Communication Protocol and Dynamic Library

Refer to *CRT-310-V30 Communication Protocol.PDF* and *CRT-310-V30 Dynamic Library.PDF*

About the communication protocols of other compatible products, please refer to related documents and we have no related Dynamic Library.