CRT-531
Card Dispenser Machine
Ver1.0

PRODUCT SPECIFICATION

CREATOR (CHINA) TECH CO., LTD.

·Add: 2F, M-10 Building, Center Area, Hi-tech Industrial Park, Shenzhen, China
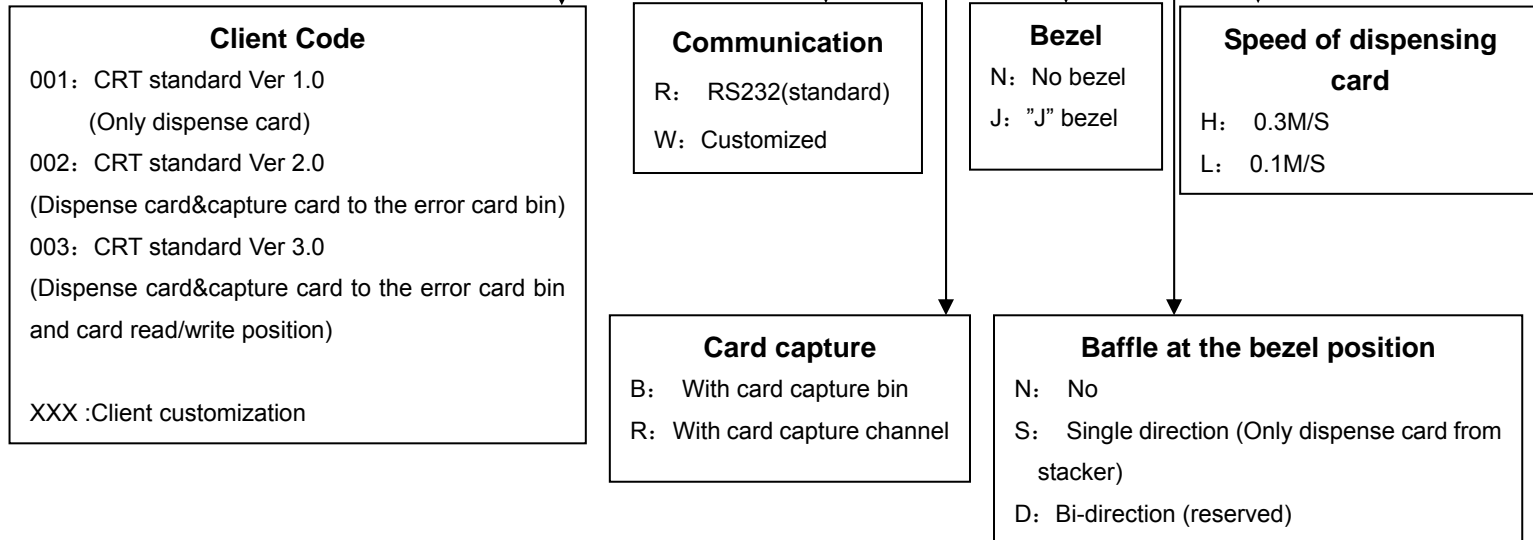
·TEL:+86 755 26710691   FAX:+86 755 26710105

·Http://en.china-creator.com/

1. OVERVIEW

CRT-531 is card dispenser with RS232 and TTL interface.

CRT- 531- （ ☐ ☐ ☐ ） ☐ ☐ － ☐ ☐ ☐

Client Code

001：CRT standard Ver 1.0
(Only dispense card)

002：CRT standard Ver 2.0
(Dispense card&capture card to the error card bin)

003：CRT standard Ver 3.0
(Dispense card&capture card to the error card bin
and card read/write position)

XXX :Client customization

Communication

R： RS232(standard)

W： Customized

Bezel

N：No bezel

J："J" bezel

Speed of dispensing card

H： 0.3M/S

L： 0.1M/S

Card capture

B： With card capture bin

R： With card capture channel

Baffle at the bezel position

N： No

S： Single direction (Only dispense card from
stacker)

D：Bi-direction (reserved)

NOTE：CRT-531 Fittings
Extra long stacker： CRT-500-TCZ
Long stacker： CRT-500-CKZ
Short stacker： CRT-500-DKZ
Iron-block: CRT-500-MKK

2. GENERAL SPECIFICATIONS

1) Power supply
DC 24 V ± 10%

2) Current consumption
Static current 0.1A
Peak current during operation 1.5A
(700mA in normal condition)

3) Card feeding-out speed
Approx. 0.1m/s or 0.3m/s

4) Communication
RS-232C

5) Card standard
Size: 55×86 mm
Thickness: 0.20~1.2mm
(≥1.2mm need customization, Ex-work setting: 0.8mm)

6) Weight
2.5 Kg Approx.

7) Dimensions
Refer to the enclosed mechanical drawing

8) Card stacking capability
185pcs in case of 0.76 mm card
(Available set to 500PCS Max.)
Stacker fitting: Short: 60PCS;
             Long: 170PCS
             Extra Long: 300PCS

9) Card pre-empty detection
7~50pcs±2pcs

10) Environmental conditions
Operation: 0~50℃, 0 ~ 90 % RH (Without Condensing)
Storage:-10 ~ 75℃, 0 ~ 90 % RH (Without Condensing)

3. FUNCTIONS

1) Detection function
   To detect the card empty, card pre-empty or full of error card bin

2) Doubled card dispensing prevention function
   Mechanical design, one motor forward, the other motor backward operation, to fundamentally prevent 2 cards dispensing at the same time

3) Easy card thickness adjusting device.

4) Sensor circuit integration and photoelectricity to ensure the machine's stability and maintain

5) Pre-dispense function accelerate the speed of dispensing, to keep dispense continuously

6) Download on line: support ISP download on line

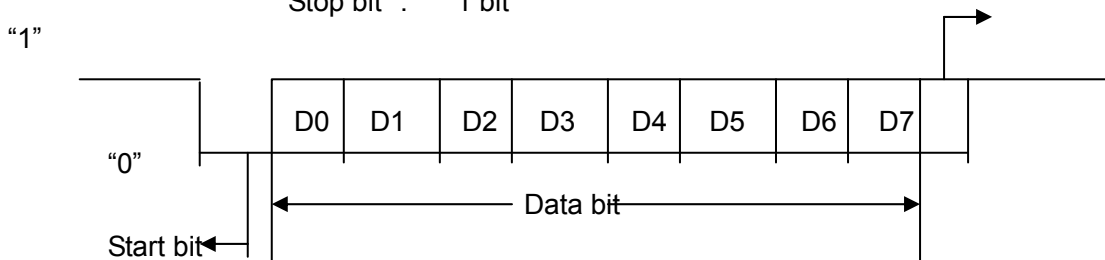7) Option for the speed of dispensing card.

4. RS232 COMMUNICATION

4.1 RS232 Communication protocol

Baud rate (BPS)   :   Can be set by the host (Default: 9600 bps)
Communication type   :   Asynchronous communication
Transmit type   :   Half duplex
Bit details

         Start bit :   1 bit
         Data bit :   8 bits
         Parity bit: None
         Stop bit :   1 bit

"1"

D0	D1	D2	D3	D4	D5	D6	D7

"0"

Data bit

Start bit

4.2 Command structure
4.2.1 Send command

     〈STX〉   O O   X   〈ETX〉   〈BCC〉

                           Command

〈STX〉   ：0 2 H，   frame start

〈ETX〉   ：0 3 H，   frame stop

〈BCC〉   ：〈S T X〉⊕0⊕0⊕   〈E T X〉，block parity

 'O'   ：   ASCLL of one bit

 'X'   ：   ASCLL of one bit, parameter of extending command(Possible to be
                without the basic command)

4.2.2 RF Status checking return

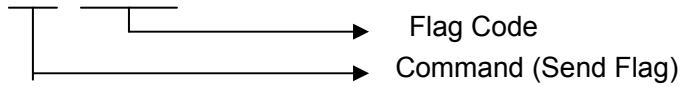
        <STX>   S F ○ ○ ○ <ETX><BCC>

                                                     → Flag Code

                                                     → Command (Send Flag)

<STX> : 0 2 (HEX) , Frame start

<ETX> : 0 3 (HEX) , Frame end

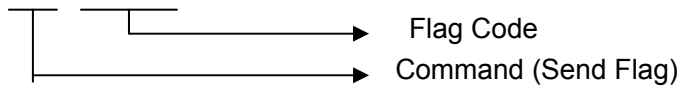<BCC>: <STX> ⊕ 'S' ⊕ 'F' ⊕ 0 ⊕ 0 ⊕ 0 ⊕ <ETX>, Block Check Code

Definition of Flag Code

HEX	BIN			STATUS
800	1 0 0 0	0 0 0 0	0 0 0 0	Dispensing card
400	0 1 0 0	0 0 0 0	0 0 0 0	Capturing card
200	0 0 1 0	0 0 0 0	0 0 0 0	Card Dispense error
100	0 0 0 1	0 0 0 0	0 0 0 0	Card Capture error
080	0 0 0 0	1 0 0 0	0 0 0 0	No Capture card
040	0 0 0 0	0 1 0 0	0 0 0 0	Overlapping cards
020	0 0 0 0	0 0 1 0	0 0 0 0	Jamming Card
010	0 0 0 0	0 0 0 1	0 0 0 0	Card pre-empty Status
008	0 0 0 0	0 0 0 0	1 0 0 0	Card empty Status
004	0 0 0 0	0 0 0 0	0 1 0 0	Disp-Sensor Status
002	0 0 0 0	0 0 0 0	0 0 1 0	Capt-Sensor 2 Status
001	0 0 0 0	0 0 0 0	0 0 0 1	Capt-Sensor 1 Status

4.2.3 AP status checking return

<STX>　S F ○○○○ <ETX><BCC>

→ Flag Code

→ Command (Send Flag)

<STX> : 0 2 (HEX) , Frame start

<ETX> : 0 3 (HEX) , Frame end

<BCC>: <STX> ⊕ 'S' ⊕ 'F' ⊕ 0 ⊕ 0 ⊕ 0 ⊕ 0 ⊕ <ETX>, Block Check Code

Definition of Flag Code

HEX	BIN				STATUS
8000					（Reserve）
4000					（Reserve）
2000	0 0 1 0	0 0 0 0	0 0 0 0	0 0 0 0	Failure alarm (sensor invalid)
1000	0 0 0 1	0 0 0 0	0 0 0 0	0 0 0 0	Error card bin is full
0800	0 0 0 0	1 0 0 0	0 0 0 0	0 0 0 0	Card Is Dispensing
0400	0 0 0 0	0 1 0 0	0 0 0 0	0 0 0 0	Card Is Capturing
0200	0 0 0 0	0 0 1 0	0 0 0 0	0 0 0 0	Card Dispense error
0100	0 0 0 0	0 0 0 1	0 0 0 0	0 0 0 0	Card Capture error
0080	0 0 0 0	0 0 0 0	1 0 0 0	0 0 0 0	No capture
0040	0 0 0 0	0 0 0 0	0 1 0 0	0 0 0 0	Card overlapped
0020	0 0 0 0	0 0 0 0	0 0 1 0	0 0 0 0	Card jam
0010	0 0 0 0	0 0 0 0	0 0 0 1	0 0 0 0	Card pre-empty
0008	0 0 0 0	0 0 0 0	0 0 0 0	1 0 0 0	Card empty-Sensor Status
0004	0 0 0 0	0 0 0 0	0 0 0 0	0 1 0 0	Disp-Sensor Status
0002	0 0 0 0	0 0 0 0	0 0 0 0	0 0 1 0	Capt-Sensor 2 Status
0001	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 1	Capt-Sensor 1 Status

4.3 Basic command code（Compatible with KDE-1500）

Command（ＡＳＣＬＬ）	Content	Return message
ＤＣ	Dispense card to exit	< 06H>
ＣＰ	Card capture	< 06H>
ＲＦ	Status checking	Ref: RF status checking return
AP	High-class status checking	Ref: AP status checking return
RS	Reset	< 06H>

4.4 Extend CRT Command

Command + Parameter	Return	Comment
"FC"+ Position	<06H>	Card stop on the specified position，{0，1，3，4，5，6} parameter: 0x34,0x33,0x32,0x31,0x36,0x37}
"CS"+ Position	<06H>	Set up Baud rate.(0-5, indicate 1200BPS-38400BPS)
"IN"+ Parameter	<06H>	Setting of card inserted from dispenser mouth: Parameter =0x30 Prohibit cards in =0x31 Allow cards into error card bin =0x32 Allow cards into card read/write position (I.e. card stop location 2)
"SI"	SI +Parameter(similar to RF command returned)	Check the setting status of card inserted from the dispenser mouth

Note：（1） "4"is the position for card pre-dispense, program will execute "pre-dispense" automatically(Except press "Reset" keystoke on the dispenser by hand); Execute "FC+4", no any reaction for this command, and this will cause unpredictable damage, so please don't use this command in a hurry.
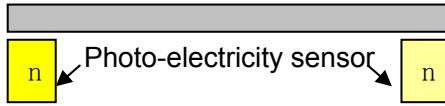
(2)The operation of checking status for "SI" inserting card from dispenser mouth is similar to "RF" and "AP". The parameter of command returned with 1byte is same as the "IN"parameter.

(3) "IN" is an operation command for EEPRON. The setting status will not be affected even if it is power on or reset, that means the last setting is still valid when power on. And It is defaulted that the card is captured to the error card bin when ex-work.
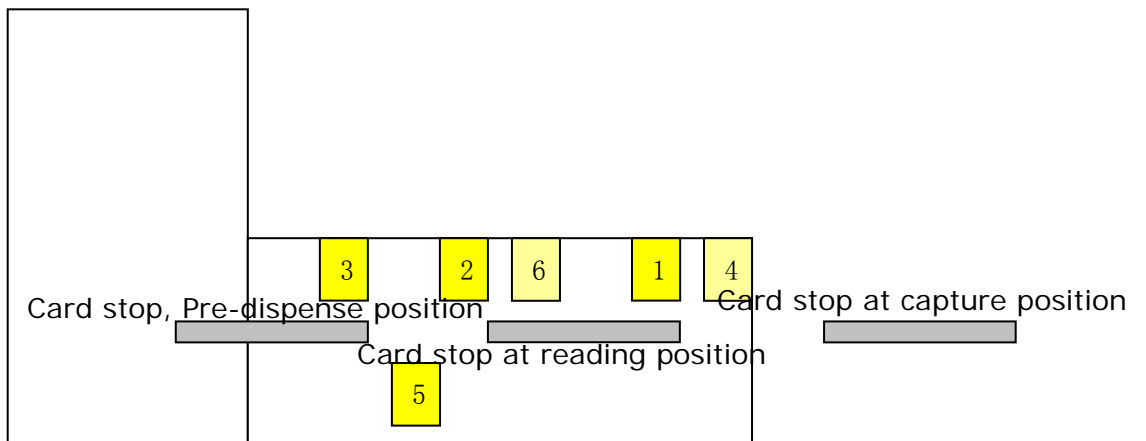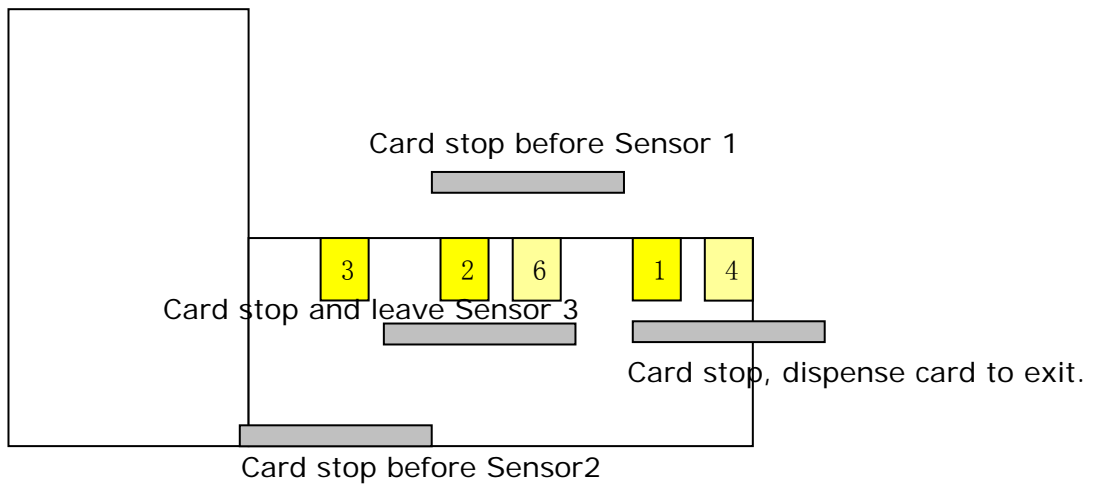
4.5 Specification of photoelectricity sensor and card stop location

4.3.1 Definition of graph

n   Photo-electricity sensor   n

4.5.2 Sketch map of card stop location and photoelectricity sensor

Card stop before Sensor 1

3   2   6   1   4

Card stop and leave Sensor 3

Card stop, dispense card to exit.

Card stop before Sensor2

3   2   6   1   4

Card stop, Pre-dispense position

Card stop at capture position

Card stop at reading position
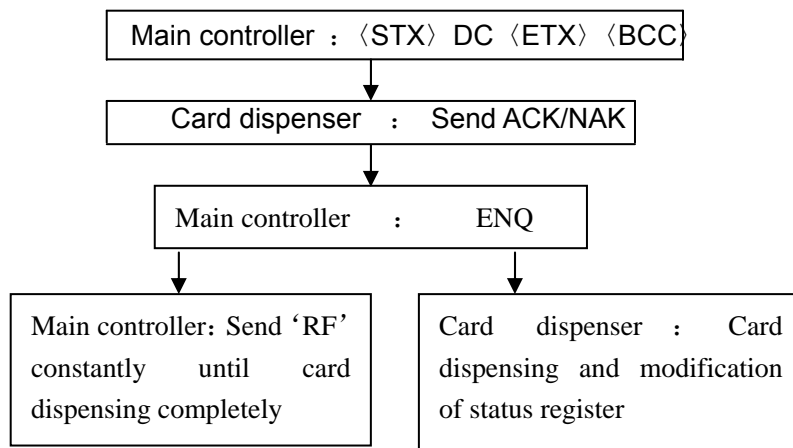
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4.6 Communication sample：

4.6.1 Card dispensing

Main controller ：〈STX〉 DC 〈ETX〉〈BCC〉

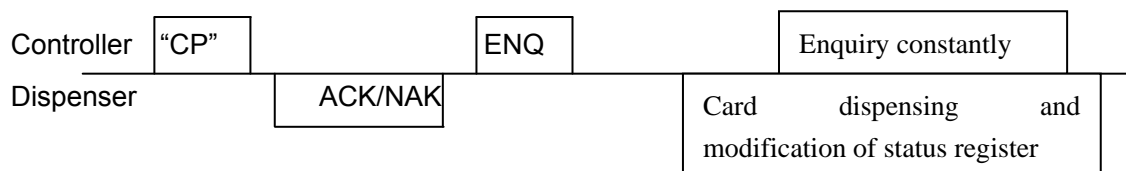Card dispenser ： Send ACK，responsible for card dispensing and modification of status of register

Main controller	DC		ENQ			Enquiry constantly	
Card dispenser		ACK/NAK				Card dispensing and modification of status register	

thereinto： 〈ACK〉：06H

〈NAK〉：15H

〈ENQ〉：05H

Procedure as follow:：

Main controller ：〈STX〉DC〈ETX〉〈BCC〉

↓

Card dispenser ： Send ACK/NAK

↓

Main controller ： ENQ

↓

Main controller：Send 'RF' constantly until card dispensing completely

Card dispenser ： Card dispensing and modification of status register
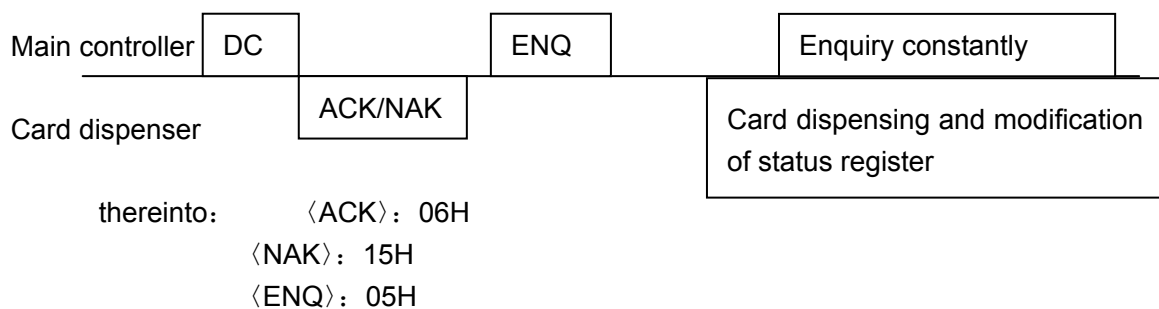
4.6.2 Card capture（the procedure is similar to card dispensing）

Main controller ：〈STX〉 CP 〈ETX〉〈BCC〉

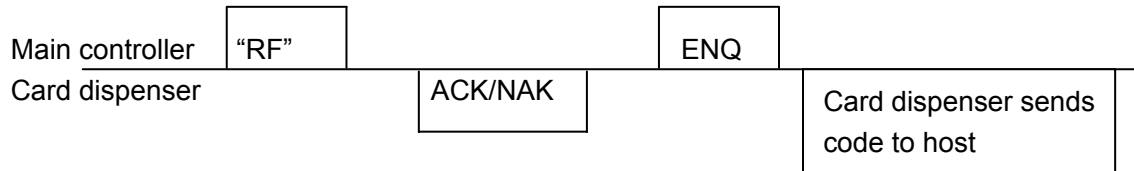Card dispensing ：Send ACK，responsible for card dispensing and modification of status of register

Controller	"CP"			ENQ			Enquiry constantly	
Dispenser			ACK/NAK				Card dispensing and modification of status register	

4.6.3 Status require

Main controller   ：〈STX〉   RF 〈ETX〉〈BCC〉

Card dispenser   ：Send ACK, receive ENQ, then send 〈STX〉 SF   OOO〈ETX〉

Main controller	"RF"			ENQ	
Card dispenser		ACK/NAK			Card dispenser sends code to host

5. TTL Interface

Pin No.	SIGNAL	IN / OUT	AVAILABILITY STATUS
1	Receive cards	IN	LOW impulse
2	Dispense card to the gate	IN	LOW impulse
3	Ground sensor	IN	Low falling
4	System Reserve	-	
5	Dispense step by step	IN	LOW impulse
6	Ground sensor available	IN	High impulse
7	Error card bin full	OUT	LOW impulse
8	Dispense success	OUT	LOW impulse
9	Pre-card indication	OUT	LOW impulse
10	Capture card success	OUT	LOW impulse
11	Receive card success	OUT	LOW impulse
12	Stacker empty/ fault	OUT	LOW impulse
13	Isolating GND	Isolating power	
14	Isolating Vcc	Isolating power	
15	System Reserve	-	
16	System Reserve	-	

Notes:

1. Low impulse: Recommended width (50-100ms)

2. Dispense step by step: First low impulse, Dispense card to card reading position.

3. Second low impulse, Dispense card to the gate.

4. Isolating power needed (Voltage do not higher than 12V, recommend 5V power)

5. Ground sensor available:

   =1, require ground control signal

   =0, do not require ground control signal
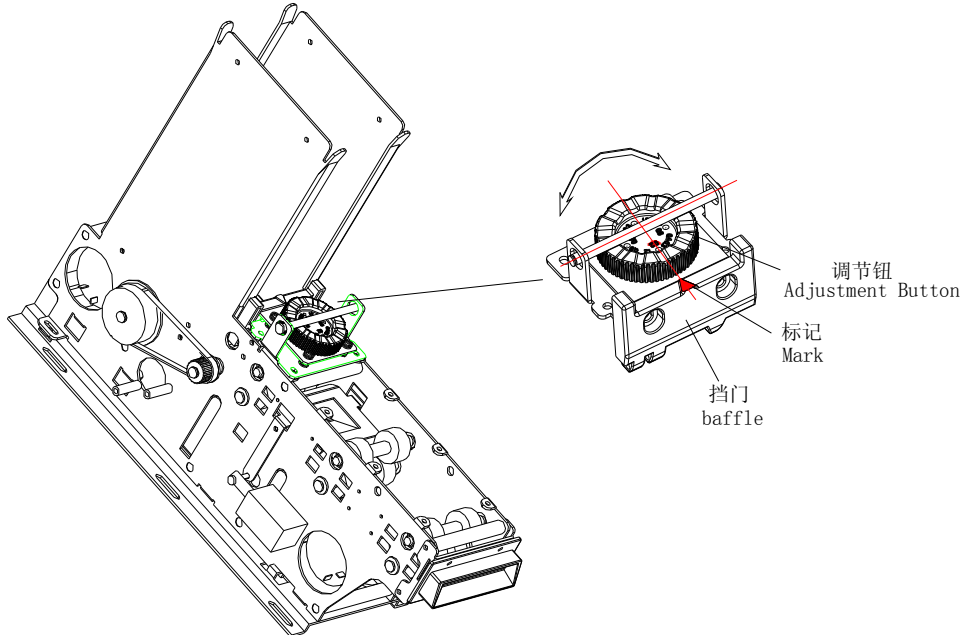
6. ADJUST THE THICKNESS OF CARD DISPENSING

CRT-531 makes it more accurate and convenient to dispense the cards in different thickness via rotating the turn-knob to different gear position so as to adjust the gap between the upper and lower transmitting wheels, which can eliminate the inconvenient and inaccurate gap adjustment defects. With this feature, CRT-531 is quite suitable for the unattended vending devices to dispense various cards of distinct thickness.

There are several steps to adjust the thickness of cards:

1. Confirm the thickness of cards (Raised type character are not involved in)
2. Push the turn-knob and turn around to the graduation pointed by the red arrow. Seeing pictures below.
3. Make sure the adjustment on the right position by insert cards from stacker. (Inserting one card from stacker will be smooth and two cards simultaneously from behind can be impossible)

调节钮
Adjustment Button

标记
Mark

挡门
baffle

7. MAINTENANCE AND CAUTIONS

7.1 Maintenance

After using for some time or dispensing amount of cards, the dispenser will be serious wearing because of every part is running, so we need to do some maintenance to the machine. The steps as follows:

1）Check the parts of the dispenser. If they become flexible or abnormal, reinforce them.

2）Check the straps of drive wheels. If they become flexible, regulate the position of the elasticity wheel.

3） Use cleaning card or soft cloth with alcohol to clean the dispenser wheel in the bottom of the hopper and the drive wheel.

4）Use soft cloth with alcohol to clean the dirty cards and replace the distortion cards

5) Check the graduation of knob to see whether they are corresponding.

7.2 Cautions for safe use

1） Ensure the power connected with card dispenser is off while repairing the whole machine.

2） Notice the cathode and anode of the machine power while power on for the first time.

3） Notice the Specification of JUMP when using for the first time, because improper JUMP will cause work off or unpredictable status.

4） If you do not use insulation power, external power must not be connected to insulation power, otherwise, PCB will be broken.

5) Prohibit to inset or pull out the receptacle of the port. Otherwise, the circuit of the controller may be spoiled.

6） Ensure the dispenser out of smear. The smear will affect the capability of the dispenser.

7) On the back of dispenser side board, there is a red soft manual "Reset" keystoke. When error or abnormal situation occurs on spot, then engineer can press this keystoke for reset. It is not used in general situation.

8) Red soft "RESET" keystoke function is looked as card coordinating and card return to pre-dispense or capture position when error occurs. Once use "RESET", Pre-dispense will be invalid, until use "DC" and "FC".

9) "RESET" has overtime protection function, when the keystoke is pressed for a long time, then motor will stop automatically to protect itself.

7.3 Caution for program

1）"4"is pre-dispense position, FC command will not has the function of this position.

2）In order to improve the communication speed of the program, condition inspection will just be execute one time when "RESET"; User can "Reset" to check if the condition is correct. (Reset by three ways: press "RESET" on PCB of dispenser bottom, press red soft "RESET" on back of dispenser side board, or by power on/off)

3) Under RS232 mode，sending enquiry command will cause program enter communication interruption processing, which will affect card dispensing and other execution, the time alternation for next enquiry command should be over 200ms.

7.4 WARRANTY

1) One year guarantee free of charge. Counting from the day that users receive the goods.

2) User sends the goods to us for repairing.

3) Provide after-sale service after exceeding guarantee period. We will take some material fee if need to replace fittings. And we will take some upkeep in the follows situations   although it is in guarantee period:

a) Damage and trouble caused artificially;

b) Damage and trouble caused by non-professional operation;

c) Damage and trouble caused by instability of user's power supply;

d) Damage and trouble caused by force majeure, such as earthquake, natural weather etc.

8．STRUCTURE AND DIMENSION DRAWING