EAS - ZB001 (RX and TX)

Electronic Article Surveillance

English Manuals

SUN LEADER

SHENZHEN XINLIDAHONG TECH CO.,LTD

Adress: 6/F. 15#. Futing Industry Zone. Guanlan. Longhua. Shenzhen. China
TEL: 0755-83763507
FAX: 0755-61283590
Http//:www.szxldh.com
E-mail:zgj@szxldh.com

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Catalogues

Elementary knowledge of EAS ----------1- 3

Installation standards of EAS ----------3- 4

Installation Instructions ----------4- 6

TX(Transmitter board)PCB schematic ---------- 7

RX(Receiver board) PCB schematic ---------- 8

Synchronous of transmitter board PCB schematic ----------9-11

How to use EAS tag and label---------- 10-11

How to decode for soft lablel and remove tags ---------- 11

how to deal with system alarm for loss Prevention staff ---------- 11-12

Personnel manual of Equipment maintenance ---------- 12

Figure P9 ----------13

Figure P10 ----------14

Figure P11----------15

Installation distances standard of different board----------16

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Elementary knowledge of EAS

First, what is EAS system? Why should we use EAS system?

EAS is short for "Electronic Article Surveillance system", which is referred to is the use of high-tech electronic technology, the product itself has a self-defense, anti-theft capabilities from traditional "people's protection " to physical protection ", changes of technical protection", to achieve accurate , effective and advanced anti-theft system .
Use reasons:
1, As supermarkets, warehouse-style retail stores has been increase, when bring convenience to customers at the same time, the loss of goods are becoming increasingly serious.
2. The traditional man to man, monitor and other "people's protection " technology, due to fatigue if man to man in the larger store and more flow of people, when, in fact, failed to play an effective role in security. Meanwhile, in order to minimize damage, we had to increased worker ,which caused the extra costs for the mall.
3, the traditional "people's protection" technology will give the customer a sense of being monitored. Not really to create a leisurely and free environment for customers. However , changes of technical protection not only played a precise and effective anti-theft effect, and also reduce the monitoring staff to create a good shopping environment for customer as well.

Second, what is it different and benefic compared with other security techniques, such as TV monitoring systems and human security

1. Pointed protection instead of monitoring and anti-theft . which is bring
2. Self-defense, anti-theft products do not rely on the protection of people, customer-demand, self-defense package of goods and commodities;
3. Prevention of pure technology instead of monitoring people, so that customers are respected;
4. Trust customers and create a good shopping environment. Meanwhile ,lett thieves "self exposure"

Third, what is the consists of RF system t? What is the rationale?

1, The detection system: the transmitter, receiver and power supply ;
2, the electronic tag:
A, can decode the label (soft labels): for department stores, audio, books, etc.; (one time)
B, can not decode the labels (hard tags, CD and cigarettes safety box) which is applied to clothing, bags, shoes, milk, wine, etc.; CD, cigarettes, etc. (can be recycled.)
3, the deactivator:
A, Electronic deactivator: can decode the soft label with remote
B, scan / decode: to finish decoding of soft labels when scanning barcodes on products at the same time
C, detacher : at the cashier's mechanically remove hard tags from merchandise.
Rationale: 7.5 ~ 8.5MHz FM transmitter signal, which generated a warning in electric field when electric field detect sensor tags ,which will give response in a alarm

Fourth ,the differences between hard tags and soft labels ,the scope of use and the decoding method respectively

a) deactivator can decode the soft tag(only one time) and, can not be directly attached to the on the metal, foil shield which is suit for department stores ,such as hair lotions, boxed and other precious commodities.
b) Hard tags can not be decoded, can be used to open by detacher which is applied to clothing, bags, shoes, milk, bottles and other goods.

Fifth, the RF system requirements for working environment and factors affected the system

A, environmental requirements:
1, The detecting distance can not be more than 1.5M ,no large metal objects and 220V open wire around RF system
2, the distance deactivator of installation distance should be away from the system 1.5 M or more;
3 spotlights should be around 1.5 distance or more .
B, influence factors:
1, active interference:
spark interference;
motors, hair dryers, electric drills and other high-power electronics;
High-handed Spots
caused by poor ignition contacts
Power clutter caused serious interference

2, passive interference:
large metals around RF system
wire of rolls
cashier's POS machines, printers, and a variety of signal lines

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Product design and installation standards of Electronic security systems

1, The engineering design should be base on practical, economical and reasonable principle.
2,Make sure that the meet all the technical indicators of EAS equipments , especially the distance of installation
3,Tthe distance should be greater than 1.5M. between EAS equipments and deactivator
4, must note: power supply lines of EAS equipment must be separate from the installation site from the nearest box with leads, and the supply line can not be shared with other devices.
5, must indicate no large metal objects and 220V power (or other high-voltage lines). the location of EAS equipment around 1.0M distance.
6, Should give priority to the online use of EAS equipment when design

Installation standards:

1, Tested according to designs solutions after EAS equipment arrived .
2, Fixed installation location of EAS detector (within a target range) after tested successfully, and confirm the distances between detacher and installation location.
3, if there is some interference around environment , and should first find out the reason to interference at first .then installing fixed equipment after decided the solutions.
4, after decided installation location of EAS equipment, and mark fixed hole and wire.
5, with the electronic drill cut Φ12 holes in the fixed place Φ12 hole ,10mm width, 10mm deep geosyncline (Groove depth can depend on the
the actual situation)
6, When the work is completed, the EAS equipment installed into a fixed position → Connecting wire→ fixed (equipped with expansion gong nail) → cover the groove (equipped with stainless steel trim strip) → fixed with plastic cement or glass cement
7, all wire connections must be shielded cable wire (including wire-line and DC power wire.)
8, Safety first when under construction and replace the cut pieces, bits after cut off the power
9, Connections. of all power wires must be fixed with a line card; and wiring connections must be soldered, and strict with insulating tape package, and the connection of wire stay in groove as much as possible.
10, The detacher should be fixed to cashier's where can operate easily

Radio frequency (RF) detector, electronic securiton installation instructions

First, the main technical parameters

Transmitting antenna
- Transmitter Center frequency ... ... 8.2 ± 0.05MHz
- Rated input DC voltage 24.0V
- Rated Input Current 200Ma

Receiving antenna
- Receiver center frequency ... ... 8.2 ± 0.05MHz
- Tax Sensitivity 5μV
- Rated input DC voltage 24.0V
- Rated Input Current 180mA

Power Box
- Rated input AC voltage 220V
- Rated input power 30VA
- DC output voltage 24.0V

Second, required tools and equipment when under installation

1, earth groove cutter	1 pc
2, Electronic drill (ϕ10-12)	1pc
3, handheld electronic drill	1pc
4, adjustable wrench	1pc
5,iron hammer (5 pounds)	1pc
6, needle nose pliers	1pc
7, diagonal pliers	1pc
8, Phillips screwdriver	1pc
9, screwdriver for adjustment	1pc
10 universal meter	1pc

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Third, the installation environment

1, the selection of installation location

Electronic security detectors should be installed in the entrances .There is no building wall within 0.5m installation location. Bulk metal and other items or rolls of metal cable, cashier's (POS), deactivator and other electrical equipment should be installed away from the location of electronic security detection equipment(1.5 meters); a electrical appliances of strong electromagnetic radiation such as ,: welding machine , electric discharge machines, electrical appliances ,which should be avoid using around RF system .

2, the power supply line required

A The power supply line from electronic security detecting must be installed separately from the distribution site nearest car leads.

B, prohibiting the installation of power lines, use of other electrical equipment, and should stay away from other high-voltage power lines.

C, the power supply wire must be used ≥ 2.5 mm of the power line.

D, selection of power lines and socket , 220V/10A ,three independent plug flat socket . Using better quality is to avoid poor contact with the high frequency spark plugs, causing instability of the detector electronics and security.

E, ground power lines must be well grounded, grounding resistance ≤ 2 OHMS

F, Place of power lines socket

If the power supply line drawn from the ground, the socket should be mounted in the at 1-2 meter rang around EAS equipments .

If cited under the power lines from the ceiling, then the sockets under the power lines should be away from the ground (30CM)

Fourth, the installation process

EAS standard detector is consist of a transmitting antenna and a receiving antenna (red light at the top of antenna for the receiving antenna) independently use. Each one transmitting antenna with a power box; when multiple sets of RF antenna used simultaneously, in principle, be connected synchronously It is really difficult, but adjust the EAS equipment by technical professional , you can install synchronously ; Security detectors installed horizontal distance between the location of more than 30 meters, the vertical distance of more than 10 meters, which can be used independently.

1,selection of installation distance between the transmitter and receiver antenna

In the same environmental conditions, different types of electronic security detector which receive security tag (soft labels and hard tag) is different signal amplitude ;different types of electronic security detection is different installation distances .soft label should be installed within a distance of 0.9-1.0 meters.

2, pre-installation testing

After confirmed installation location and distance of electronic security detector , take out RF detector ,paced the fixed position ,open the plastic shell of detector ,and is under testing

A. The connection of between the power supply box and Transmitting antenna (see Figure P9 (a))

DC output cable power box (Red line) connecting the transmitting antenna board " P1" "24V / DC IN" input "+" pole;

DC output cable power box (Blue line), connecting the transmitting antenna board P1 "24V / DC IN" input "-" pole;

B. connected between the transmitter and receiver antenna (see Figure P10 (b))

Transmitting antenna board P6 "24V / DC OUT" output the "+" pole connect with the receiving antenna board P1 "24V / DC IN" input terminal "+" pole; transmitting antenna board P6 "24V / DC OUT" output terminal "-" pole, connect the receiving antenna board P1 "24V / DC IN" input terminal "-" pole;

C, the way of connecting synchronization between EAS equipments, (see Figure P11)

At first ,confirmed the master TX (preferably RX is in the center). the rest is salve TX ; P2 of all of the TX is signal input port .P3, P4 for the synchronization signal output port; All assistant TX board must be connected from " P2"the synchronization signal input port except Main TX.

connected in series

P3 or P4（output port）of main board transmitter output port with an P2(input port) of assistant transmitter board, the board vice transmitter output port P3 or P4(output port) of assistant transmitter board connect with P2(input port) of assistant TX, completing the system are connected in series . Must be noted: of the P3 or P4 of each transmit antenna board (output signal),only can connect one p2 (input port) of the assistant transmitter board .; The number of transmit antennas connected in series can not be more than eight.

parallel connection

"Sync splitter" is a 1 input 8 outputs with specialized synchronous equipments.:when P3 or P4 (output signal) on Main transmitter board input into the "sync splitter" which has 8 signal outputs . 8 signals can be directly connected into the P2 of assistant transmitter board .

Series and parallel connection

A. Series and parallel connections can be mixed in two ways.

B. Main and assistant transmitter board settings

setting of main and assistant transmitter board depends on the location of the DIP switch ; Default value of transmitter board are as follows:

Main transmitter board	set the DIP switch to "master"

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Assistant transmitter board	set DIP switch to "Slave"

C, setting of receiver board
Default value of receiver board are as follows:

	JP1	JP2
1 & 2	√	√
2 & 3		

D, Debugging
The program should be reviewed again to confirm it is correct after connection; then three-pin flat plug power supply (200V/10A) put into three-pin socket independently

When power is "ON" .you will see three green light of the RX board , which indicating that the EAS system is under working properly if without flash . Adjusting VR4 (counterclockwise) if one or two green light is flashing .The green LED does not light or only DS1 is flashing.
1,Three green LEDS (DS1, DS2, DS3) is to reflect the environmental interference. When the DS1 is flashing,DS2, DS3 is not lit, which indicating has some interference, the device can be used normally, if DS1 is always on, there is serious interference , regardless of DS2, DS3.
2, Adjusting VR4, increasing sensitivity in clockwise. The detecting results is the best if DS1, DS2, DS3 green LED is always on without flash.
* Soft labels: the system should be able to respond quickly to give a audible and visual alarm when detecting soft ; you can adjust "VR4" (clockwise) if it is less sensitive

The inspection of hard tag is the same as soft labels.

3 , Adjustments of close distances (wrong frequency)
to prevent interferences at the same installation location, two sets of EAS antenna interfere between each other, caused which is out of work. Principle : let frequency change 180MHZ into 170Hz or 160Hz
Specific operating procedures are as follows:

DIP Swiich	1	2	1	2	1	2	1	2
	Off	Off	off	on	On	Off	On	On
Modulation frequency (Hz)	150		160		170		180	

:

4.Instruction of jamming indicator LED3, LED4(RX Board)
1) When the interference is small or non-interference case (not including tags placed near the antenna and antenna generated within the detection range of passive interference or due to other than 5 meters within 20 meters of the other transmitting antenna), LED3 and LED 4 of RX is not flashing
2)When there is a strong jamming sources LED3 and LED4 will lit .We are sure there is strong interference., and the brightness of LED4 (red flashing) depends on the strength of interference.
3) When the interference is very strong (eg, large switching power supply for car around RF antenna is charging), LED4(Red light) is always on , green LED3(Green light) is no light or blinking. We make sure there is very serious interference. RF system will not alarm when detecting .We should shorten detecting distance to solve this problem

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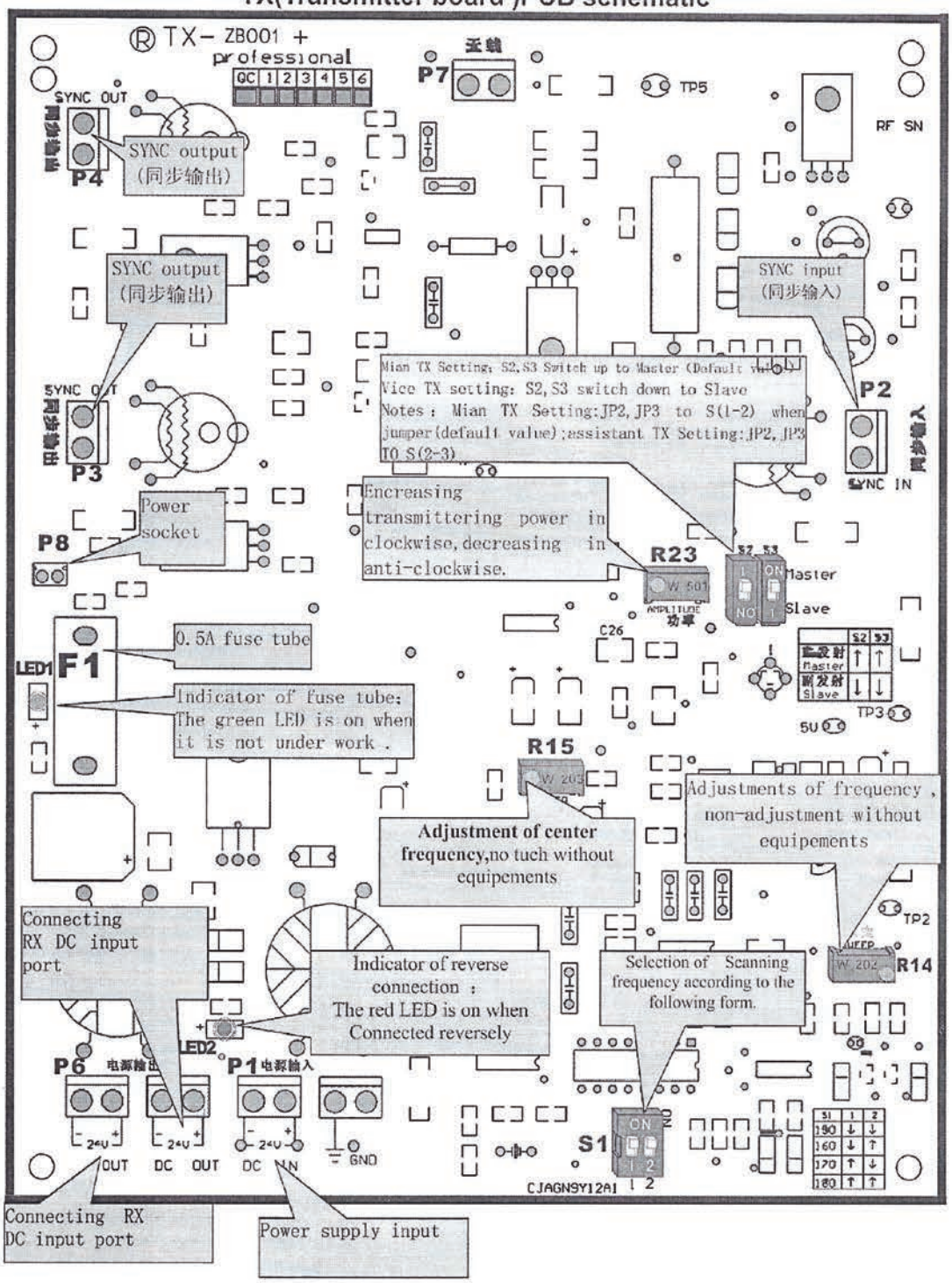
TX(Transmitter board)PCB schematic



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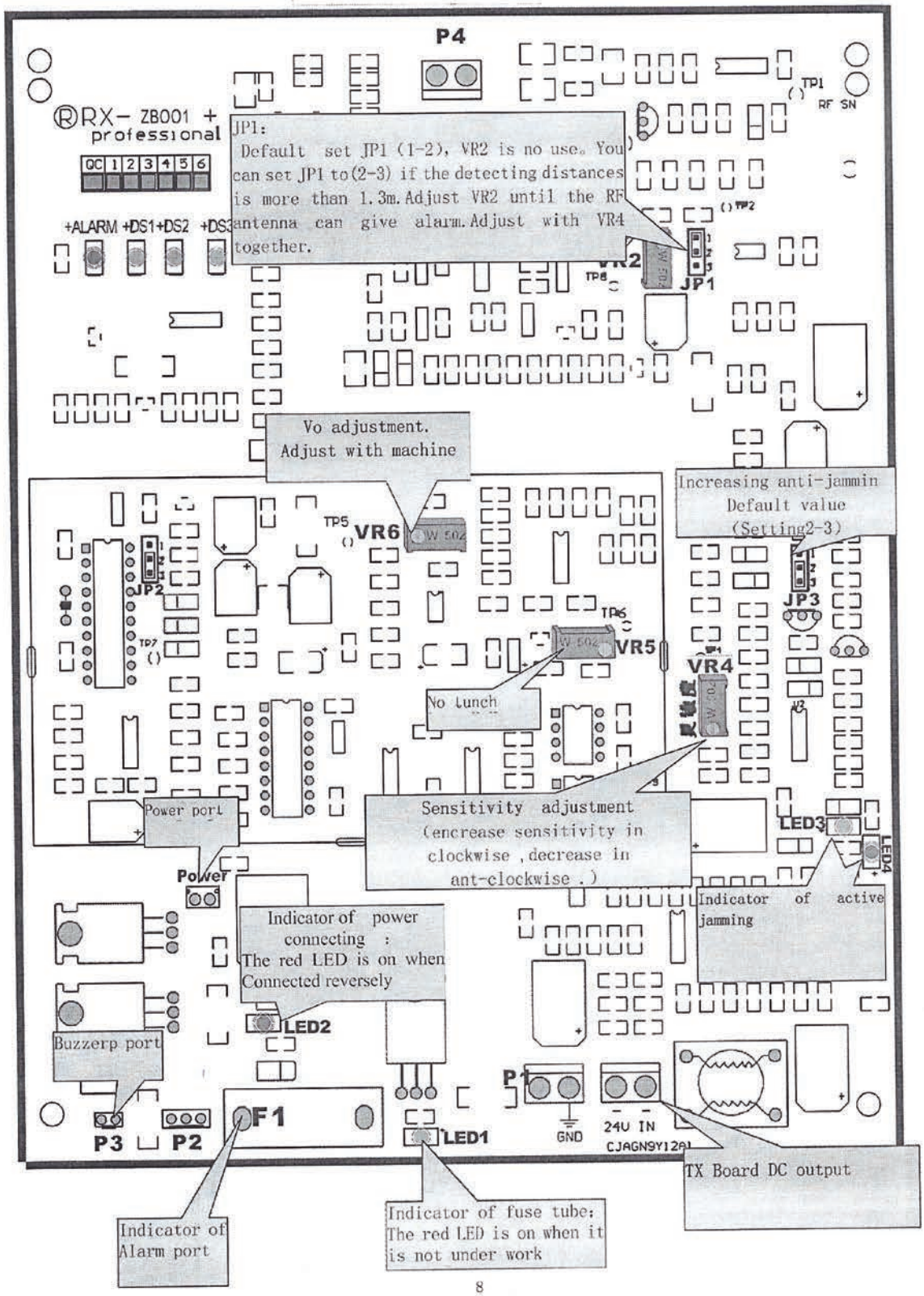
RX PCB schematic



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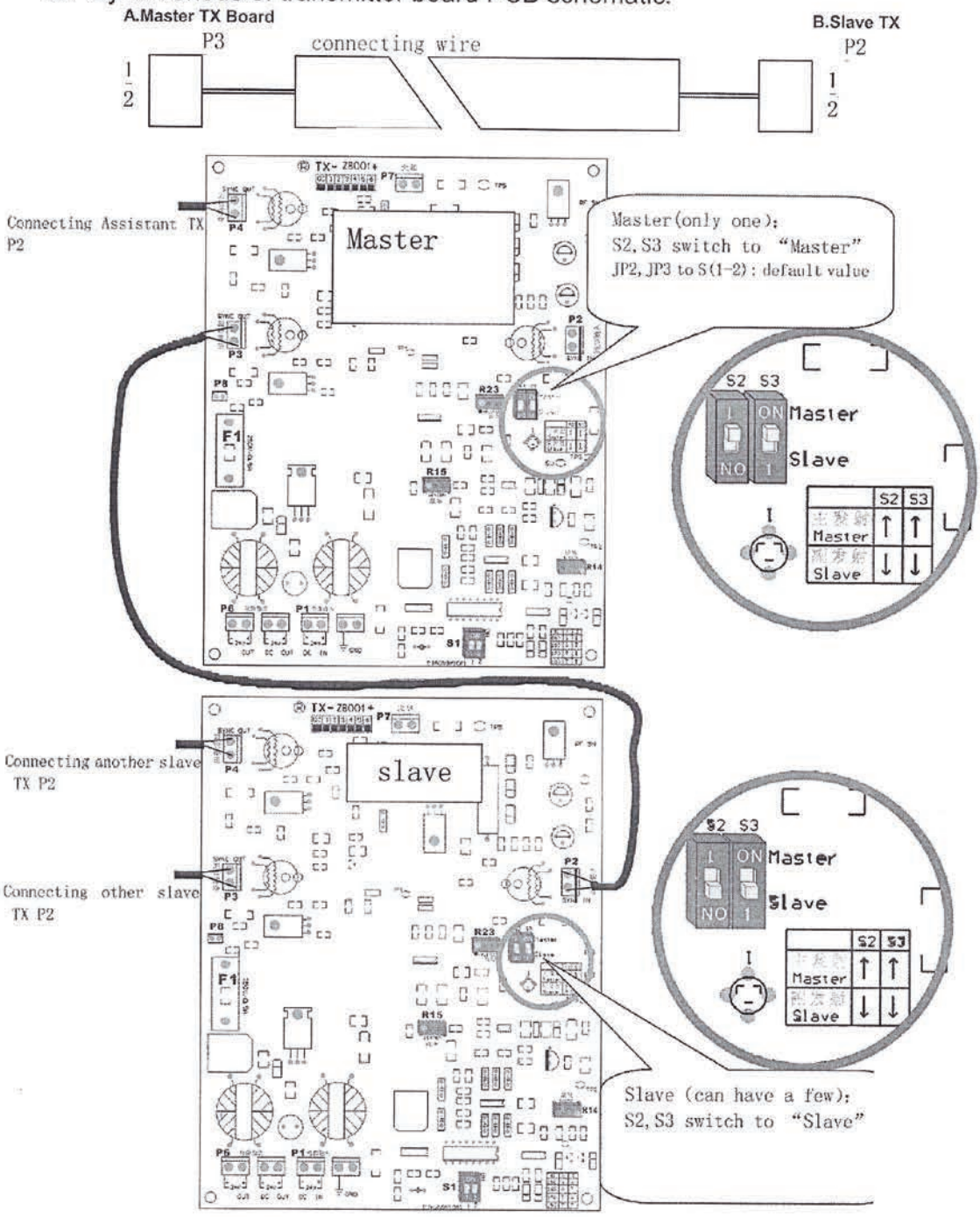
3、: Synchronous of transmitter board PCB schematic.



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How to use EAS tags and labels

First, How to stick soft labels or hard tags according to the following principles:
(1) It is easy to find and decode for the cashier (check operation)
(2) Don't damage the goods
(3) Don't affect the appearance of goods
(4)Don't cover important packaging information one the merchandise
(5) Don't fold soft tags

Second, use scope and methods of the hard tag.
Hard Tag is mainly applied to soft goods such as, textiles, bags, shoes and hats.
1. Textile goods, as far as possible through holes of clothes or eyelets at the seams of clothing,
2. Fur Commodities, the label should be stick on the grommets through the nails to avoid damage to the leather. As for the leather goods without ring , can be used special tags .

3. The label on the footwear can be nailed through the buttonhole. If there are no buttonholes, choose specialized hard tag.
4. For some specific commodities, such as shoes, liquor bottles, glasses, etc., you can use special tags or labels with ring
5. Hard tag nailed on the part of the commodity should be consistent, so that goods look neat and beautiful, and it is easy to check and operate for cashier

Third,placing of the hard tag for your references

commodities	Place		Commodities	Place
Jacket/coat	collar		hat	At the edge of hat
Shirt(withpackaging)	eyelets		Leather belt	Holes of belt
Pants	At the belt		Leather bag	Belt of bag or zipper
knitgoods	Trademark		Scarf	trademark
Swimsuit / T-shirts	commissure		shoes	buttonhole
Leather / fur coat	buttonhole or commissure		Mats	comminssure
Women's underwear	Commissure or lace			

Fourth, the soft labels

1.Soft labels stick outside goods inside
(1) Soft label should be affixed to goods or packaging, the smooth clean surface, while keeping labels flat, and pay attention to appearance.
(2) Don't stick soft label on packaging of goods where has important information, such as commodity components, use, warnings, size, barcode and the production date.
(3)Can directly stick the arc surface of goods,such as, bottled cosmetics, liquor, and shampoo. .
(4) To prevent tearing off the label by someone, the label has stuck with strong viscosity. Be careful not attached to the leather goods, because the surface of goods may be damaged if forced to torn off the labels .
(5) For a foil or metal products, not directly stick with the soft labels , find reasonable place with hand-held detector
2. place soft labels
In order to better play to anti-theft effect, the store will be in accordance with the characteristics of goods or commodity when stick in the box, you must pay attention to the following principles
(1)soft labels affixed to hidden position. Soft label placed in the light of signs around the 6CM range. So the cashier will know the general location of the label

(2)Affixing the labels on the goods should be based on the situation .Such as ,you can change the methods if the value of goods is very high ,so you can more effectively protect the goods .

(3) Attached the soft labels in many ways . Affixing the labels on the goods should be based on the situation .Such as , you can change the methods if the value of goods is very high ,so you can more effectively protect the goods .But no matter what way you choose , you should let cashier decode accurately.
(4)The placement of soft label has on effect on merchandise, such as food liquid good

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Fifth, the soft label for your reference

commodities	Situation
Cosmetics (with box)	surface or box inside
Cosmetics (no packaging)	smooth surface
Shampoo (with box)	surface or inside the box
Shampoo (no packaging)	smooth surface
Tonic health care products	* inside or surface
small items	surface
CD、DVD	on the back of the box
Recording, video tape	The back of box or specialized safty
Battery (with packaging	*back

VI. Soft label rate

First ,In general, the ratio of soft label which affixed to the goods should be 10-30% is appropriate, but the store can be dynamically managed to master the ratio of label.

How to decode the cashier, take sign

Electronic security system has a very important relationship with cashier , if a security tag attached to the goods alarm if customer has been paid the money, which make customer unhappy ,and even caused complaint

So as a cashier at a shop must be responsible to the customer, requires that each cashier must deactivator 100% after made payment, and cashier operate according to the following operational procedures.

1. Check whether the deactivator is working correctly or not.

Specific steps:

First open power of decoder , red or green indicator light, you can work; as a lamp does not light, check the plug with adapter is loose for loose or not ,

2. Check whether the decoder board is working correctly or not .

Specific steps:

under green or red indicator, soft labels should be away from deactivator at 10-15CM height while decoding

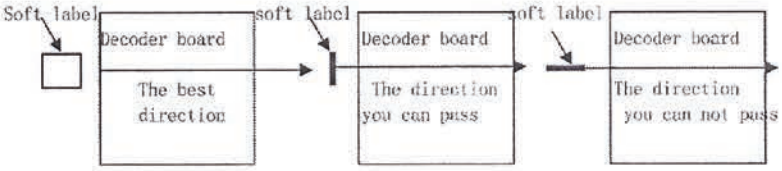
Also, please note that the decoder is the one for two pads

Second, the decoding of labels and requirements of the label

1. Firstly determine the location of sensitive goods.
2. The soft label must be decoded by deactivator, and requires six sides (for a large hexahedral terms of goods)
3. Decoding speed control by the second a commodity, not too fast, which may shows label is not completely decoded.
4. When the soft label decoded by deactivator, the system alarmed when customers leave , then the decoding is not successful, there is some problem in decoding .Should contacts the worker when this happened .

Note:

1. Control the best height from decoder to labels while decoding
2. Pay more attention to goods which material is metals or foils when the decoding result in decoding failure.
3. Note that keep the best horizontal



4. The cashier should control the three decoding direction, namely: 1. Decoding height (10-15 cm) 2. Decoding width (30-30cm) 3. **Decoding speed (per second of a commodity)**

methods of removing pin from tags.

1. Remove pin from hard tags with detacher
2. Keep good care of pin after removing from hard tags, for which avoid damage to equipment or merchandiser

Loss Prevention staff how to deal with system alarm

First, processing method of the system alarm When system is giving a alarm , staff should be processed as soon

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as possible, but must be note the following points:
A, principles
1. No hand to pull (drag) customers.
2. Smiling, simple words, let customer got your idea soon.
3. Don't doubt the customer, and should pay attention to what the staff said , avoid using the "suspect", "steal", "take", "check" and other words.

B, **Note:**
1.When the system alarm, and we can not make sure there is a theft .Sometimes the customer had paid the money, but the cashier forgot to remove the tags on the goods or decode for soft labels. Sometimes, because of this reason, the label is not completely decoded, which can cause the alarm
2. Once confirm the customer who caused the alarm, and keep good communication politely with customers to go to the office for further examination and treatment,

The inspection of equipment system :
1. Staff must make appointment with Security personnel for the inspection
2. After the shop closed, you must power off the device to extend the lifetime of equipment.
3. Equipment in the absence of the premise, in case of accidental alarm, check near the antenna coil is not like all kinds of labels or the existence of objects, and note which one antenna, when and under what circumstances the alarm? In the event of continuous and alarm, and no objects like the coil exists, temporarily turn off equipment, and speed with the engineering and maintenance personnel.

Methods of working:
1. Security personnel must stop testing equipment port, provided good care of customers out of line or channel, on a small computer shoppers to review the votes, can play a deterrent role.
2. When the alarm device to quickly determine, requiring all customers in the device and then turn around through the new, if a customer is found to cause alarm, the first diversion of people and goods on him check, in the case of basic goods to determine the alarm is not decoded.

Equipment Maintenance Guide

RF (radio frequency) systems are generally fault diagnosis methods:
1. Check device power is working (light is lit), does not work, check the key switch, power supply, or insurance is blown.

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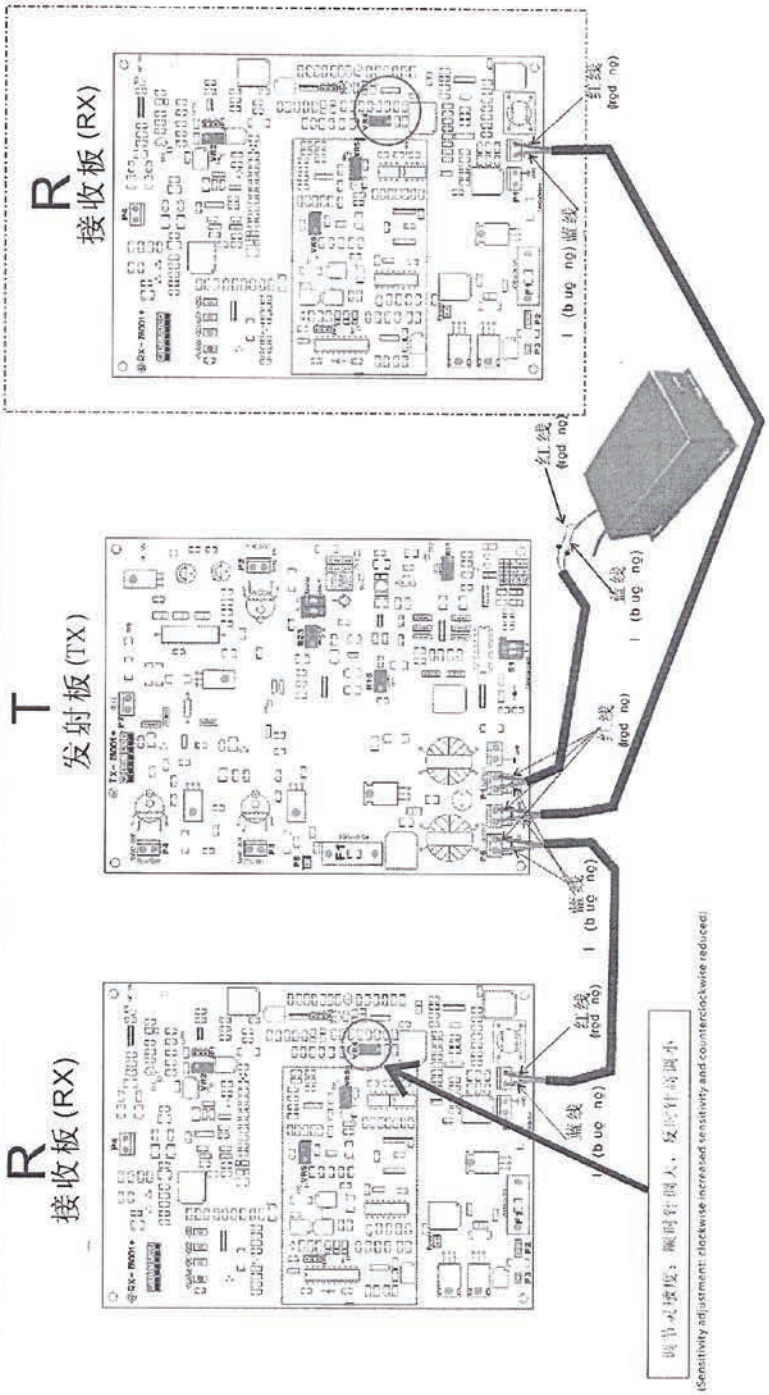
One with two connected way (one TX with two RX, use one power supply). get rid of a receiver is one with one connecting method)

一拖二接法（一支发射带两支接收，用一个电源），去掉一个接收即为一拖一接法



软标签最佳安装距离90-95CM，硬标签最佳安装距离1.2-1.5M，
现场环境干扰大的情况下可适当缩窄安装距离软标签最佳安装距离
Soft label installation distance is 90-95cm, hard tags installed distance is 1.2-1.5m,
if Scene is interference, narrowing the installation distance

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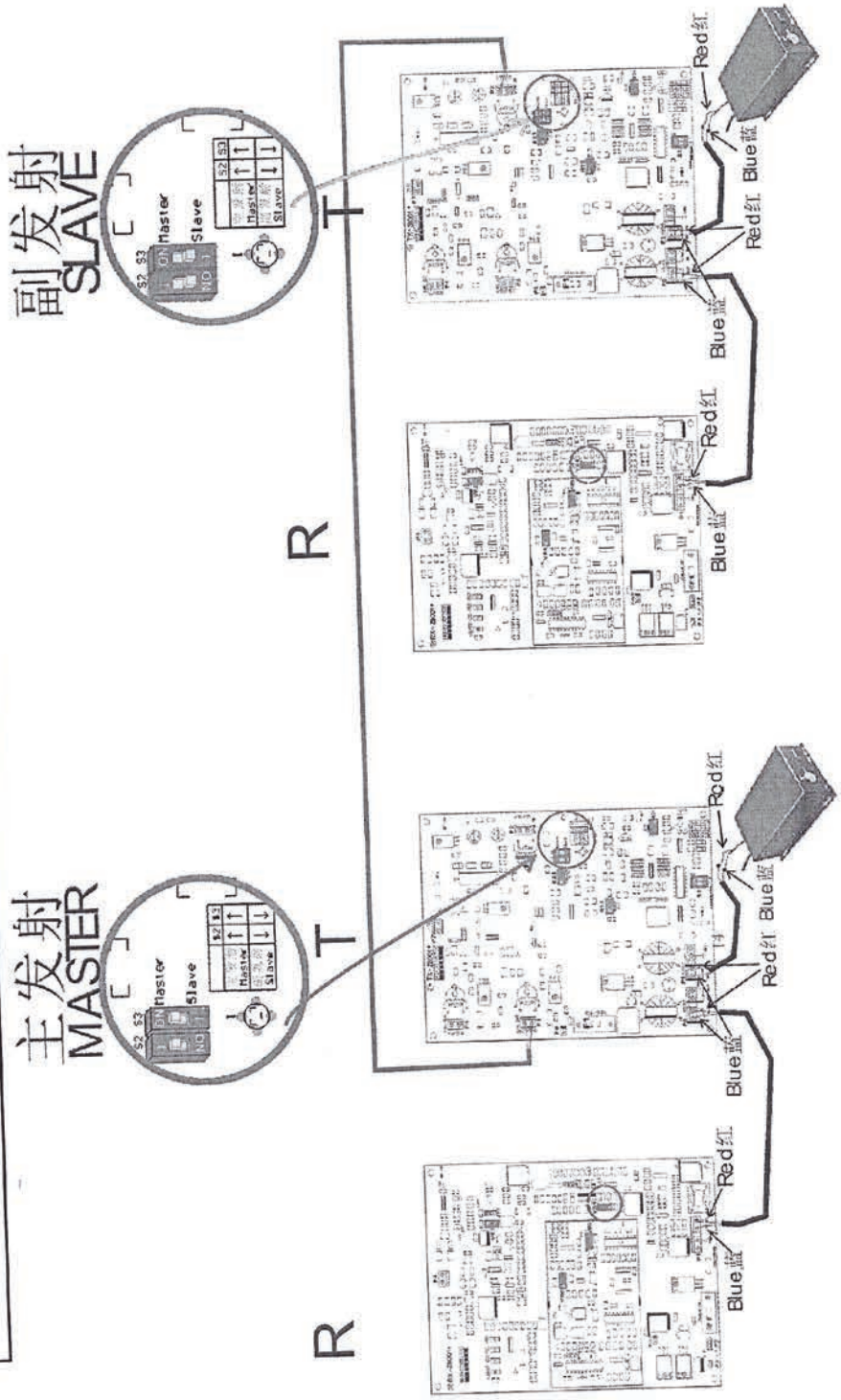
2 equipments Synchronous Transmission



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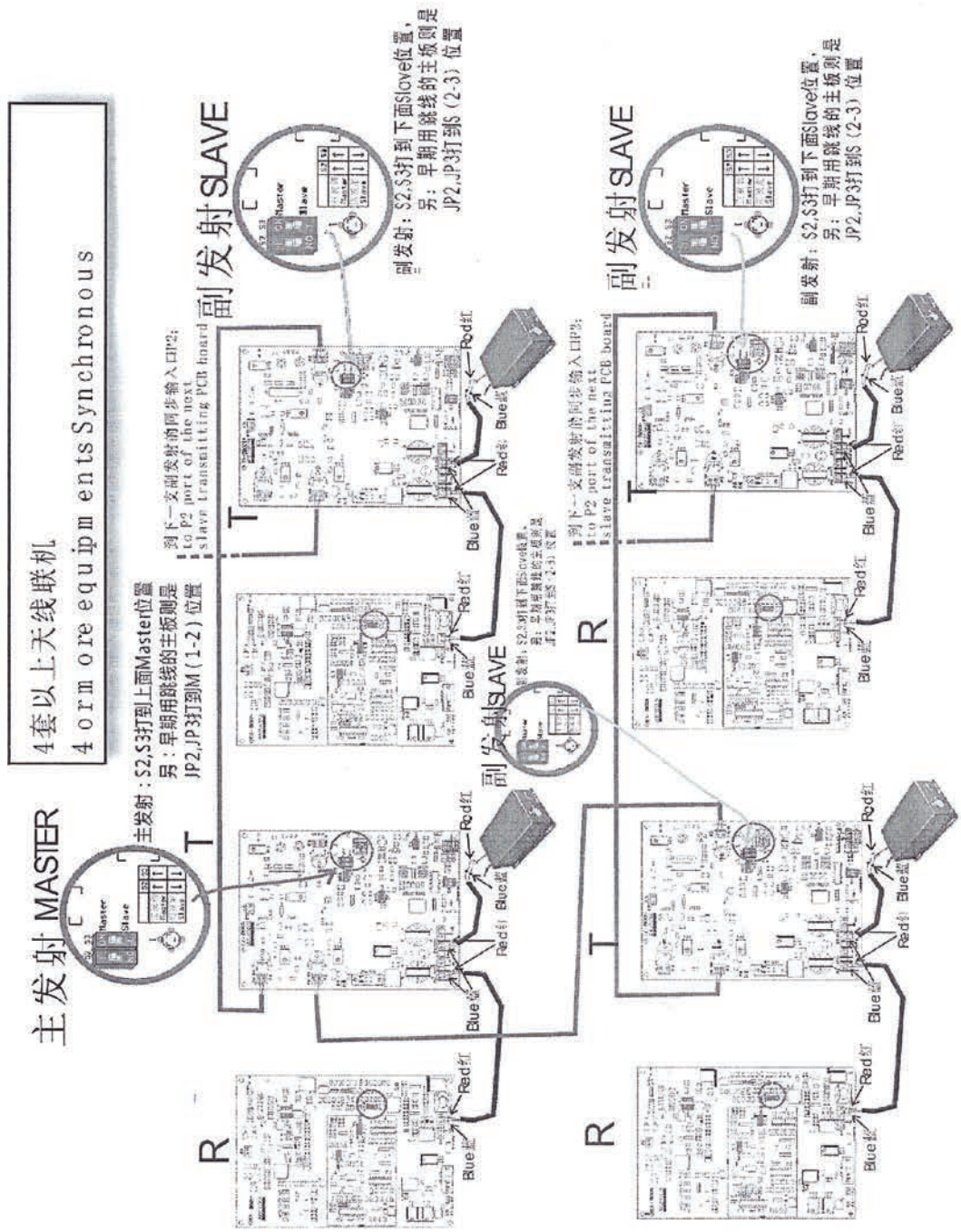

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Installation distance standard of different Board

	ZB001 Board		DSPZB001B Board		DSP ZB001C Board	
	standard	Max	standard	Max	standard	Max
Soft label	0.95m	1.00m	0.95m	1.10m	1.00m	1.20m
Small bottle tag	1.05m	1.15m	1.15m	1.20m	1.20m	1.250m
Small round tag	1.15m	1.20m	1.20m	1.25m	1.25m	1.30m
Small golf tag	1.20m	1.30m	1.30m	1.50m	1.40m	1.60m
Middle golf tag	1.30m	1.50m	1.40m	1.60m	1.50m	1.70m
Large golf tag	1.40m	1.60m	1.50m	1.70m	1.60m	1.80m
Large square hard tag	1.50m	1.70m	1.60m	1.80m	1.70m	2.20m

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