APPLICATION DEBUGGING MANUAL

AM100 SERIES EAS SYSTEM

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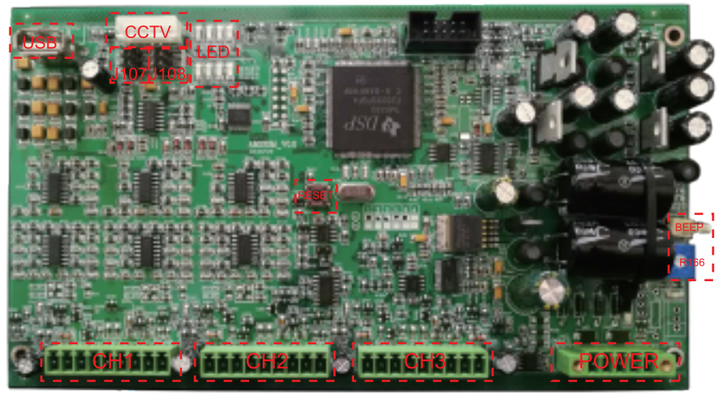
About This Manual

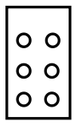
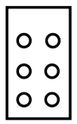
This manual introduces AM100 user instructions, including all the systems AM6008/6108/6208/6808/6811/7806/7206 /8208/8089/9800 which work with AM100 mainboards.

System Instruction

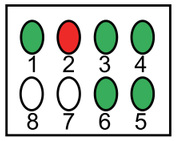
AM100 system is advanced software driven system capable of excellent detection of 58Khz soft labels and hard tags with good resistance to interference, high stability, and super detection. The AM100 system consists of a master unit which can support up to two slaves with no controller required, making large or multiple exits very cost-effective. The AM100 system is an ideal choice for any stores.

01/ Mainboard Interface Description and Hardware Manual Debugging Instructions



	Function	Settings
CH1/CH2/CH3	Connected by 9PIN cable to slave boards to form channels, CH1 is used for the master antenna by default. CH2 and CH3 are used for other 2 slave antennas as choice.	Cable connection
POWER	Connected by 5PIN cable power supply unit. Power input interface(above is the power indicator POWER LED)	Cable connection
BEEP	Buzzer interface, connected to passive buzzer	Optional
R166	Alarm volume adjustment potentiometer	Turn up clockwise and turn down counterclockwise
USB	Software debugging interface, connected by blue tuning cable	Cable connection
CCTV	CCTV monitoring alarm linkage interface, need to be linked with CCTV. Use this function we need to add extension board on the master board.	Optional
RESET	System reset button.	Factory reset:  When the fault light is red, you need reset to the factory settings. 1.Place the jumper cap on J108 3&4 2.Press the Reset button 3.Unplug the jumper 4.Press the Reset button again 5. The system resets and an alarm sounds, indicating that the factory reset is successful. After the success, the above row of lights,
J107  1&2=L 3&4=M 5&6=H	Alarm threshold:low,medium and high from top to bottom Jumper on L line: low alarm threshold, weak interference, high sensitivity,long detection distance Jumper on M line:moderate Jumper on H line: high alarm threshold,strong anti-interference,low sensitivity,nearest detection distance	System alarm threshold quick setting: The alarm threshold of each channel of the system can be set separately by software. Here,after the system has a false alarm, the maintenance personnel can easily solve the problem and reduce the maintenance amount by the person at the site. When the maintenance personnel set up in the field through the software,all need to be disconnected here.
J108  1&2=turn off TX 3&4=factory reset 5&6=Lock channel	J108-1&2:Turnoff theTX system,and choose to turn off the system when synchronizing with the surrounding devices. It must be disconnected during normal operation. J108-3&4:Resetto factory settingsparameters.	Jumper on J108-3&4 for factory reset (see RESET function) Jumper on J108-5&6: then the lower row signal indicator flashes to indicate the surrounding environment interference of the locked channel. The less the signal indicator flashes from right to left, the less interference (1.5-2 lights indicate normal), and 3-4 flashes indicate strong interference.

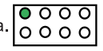
LED



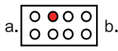
1=Working Mode
2=Fault Operation
3=CH2
4=CH1
5-8=Signal Interference Strength

(the right to the more left indicates the stronger of the interference signal)

Channel indicator observation:

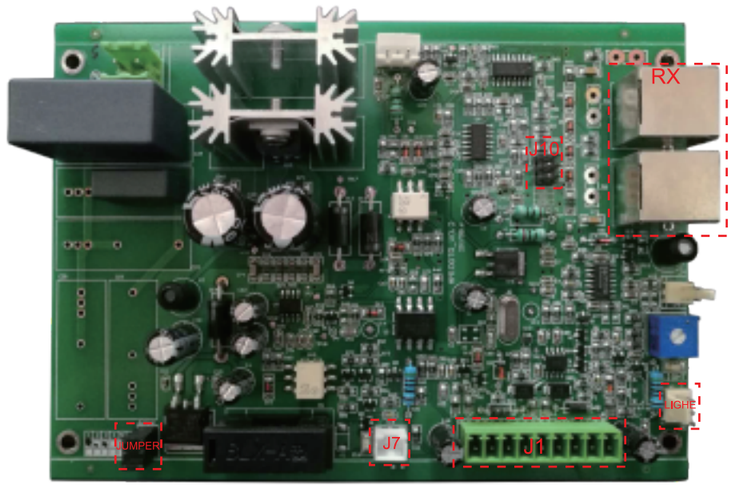
1) Under normal work: a.  b.  c. 

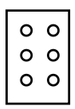
a.The first one on the left side of the upper row is the work indicator,which flashes slowly during normal operation;
b.The two lights on the right side of the upper row are channel indicators.The right light is on for channel 1, the left light is on for channel 2, and both the two lights are on for channel 3. In normal operation,the system alternately displays the signal interference strength of the three channels.
c.The channel noise and environment signal is shown from the down row(the right to the left indicates the stronger of the interference signal).1-2.5 lights on means the interference is okay; 3 lights on means quite much interference,shorter the installation distance and adjust the system sensitivity is considered in this situation.

2) Under abnormal operation: a.  b. 

a.The second one on the left side of the upper row is the fault indicator light (red light).When this light is on, it indicates that there is a fault in the operation of the board(Factory reset can be done to solve,see factory reset function).
b.The four indicators in the lower row are all on,means too much interference or the channel signalistoo weak(the lights flashes more than 3),and the system not working.On-site environment checking and tuning is necessary in this situation(see software debugging) and then fixed installation.

02/Slave Board Interface Description and Hardware Manual Debugging Instructionsructions



J1	Connect to the CH1/CH2/CH3 of the motherboard. The plugging and unplugging of this socket should be carried out in the case of power failure.The hot plugging may burn out the board.
J10  L= Level1 M= Level2 H= Level3 Jumperoff = Level4	Antenna receive sensitivity setting. Adjust according to the situation on site, the factory default is high. Divided into High, Middle, Low and disconnected four levels of sensitivity. In general, the jump cap is placed in the Low, Middle position. When the field interference is too large,you can try to disconnect both level 1 and level 2, which is the lowest sensitivity.
RX	Receiving coil of the antenna
LIGHT	Antenna warning light
J7	Power indicator port,connected to the indicator light of the case
JUMPER	JUMPERS placed here for any settings require a jumper.

03/Tuning Software Debugging Instructions

3.1 Software installation and Introduction

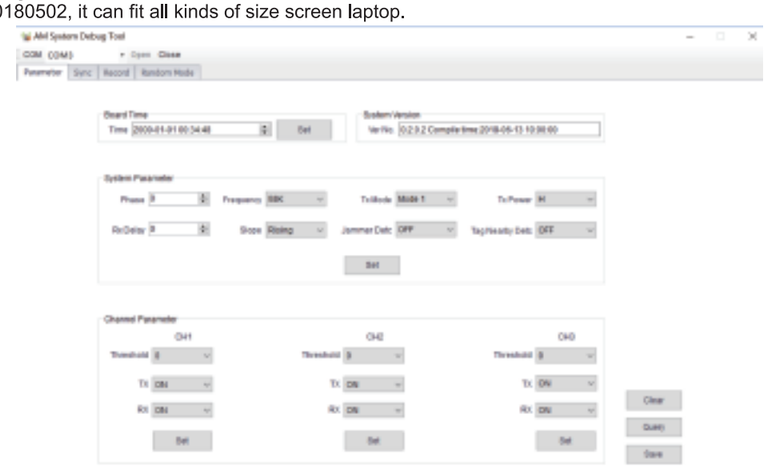
● Software updated on 20180502, it can fit all kinds of size screen laptop.
1) Install "setup.exe"
2) Install the driver: CH341SER.EXE
3) Check if the driver is successfully installed in DEVICE MANAGEMENT---COM PORT---USB-SERIAL CH341A (eg. COM1)
4) Connect the USB port on master board, the other end of USB port with driver module to the USB port of the computer with the blue debugging cable. The Software displays the COM port when connection is successful. 

Select the serial port and click Open. Click Query to have all the default parameters from the system. Click Close when debugging is complete.
5) Latest Software interface

* Software have 4 interfaces: 

3.2 Parameter Setting

Software updated on 20180502, it can fit all kinds of size screen laptop.



Parameter Item	Default Parameters	Parameters Range	Settings
Phase		0-119	Measure the phase difference and set the figure
Frequency	58K	57.8K/ 58K/ 58.2K/ 58.4K/ 58.6K	Used when the soft label frequency changes
Tx Mode	Mode1	Mode1/ Mode2/ Mode3/ Mode4/ Mode5	When the on-site environment is poor and cannot meet the test requirements,you can try to make MODE2. Mode3-5 is not available
Tx Power	H	H/ M/ L	No set
Rx Delay		0-100	No set
Slope	Rising	Rising/Falling	The position of the neutral line and the fire line are opposite. Try to change the synchronization edge.
Jammer Detc.	OFF	OFF/ON	Detecting whether there is interference source around the antenna that affects the antenna work. After detecting the antenna, the warning light of the antenna will continue to “flash 4 - - - - pause - - - - - flash 4", .In order to ensure good use,the interference source should be excluded)
Tag Nearby Detc	OFF	OFF/S/ M/ L	Detecting whether there is 58KHz labels or tags around the antenna that affects the antenna work, it will pass the antenna warning light "flash 2 - - pause — flash 2 - - Stop - - ...” prompts the clerk to check. There are a total of three options for small tag, medium tag and big tag, and the corresponding options are selected according to the tags used in the store.

Threshold	OFF	0-5	The higher the value, the higher the alarm threshold. When the field is prone to intermittent false alarms, you can choose to increase the threshold. (When set threshold in software, make sure J107 master board is disconnected, otherwise the setting of J107 will affect the software settings.)
TX	ON	ON/OFF	Set this channel antenna working mode to TX
RX	ON	ON/OFF	Set this channel antenna working mode to RX

Function Key:	
Set	Set any settings when changed
Clear	Clear the settings
Query	Query the parameters from system
Save	Save the settings

3.3 Phase Sync

Synchronization interface: The system synchronization is a graphic display of the surrounding environment and the channel signal of the antenna which is convenient for the installer to set the phase and reduce interference. The surrounding environment and the surrounding phase display the data calculated by the selected channel. For clear positioning, please select a channel for debugging.

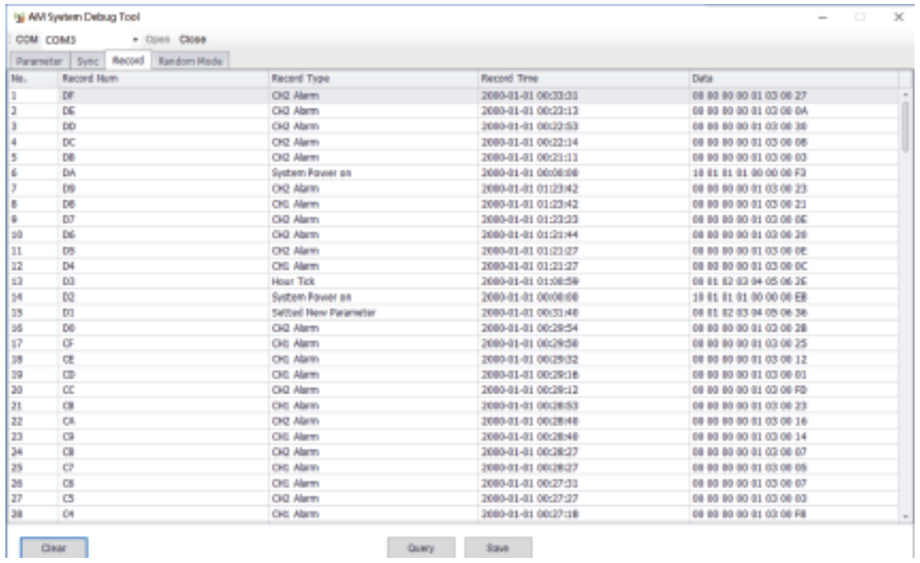
Environment	
System Phase	Red block indicates the position of the transmitting signal of this unit
Surrounding Signa	Black block indicates environment signal. The mouse can calculate the phase difference between the local unit and the surrounding equipment.
Channel Signal	
Noise	The noise in the environment
Signal	The signal interference strength in the environment
Surrounding Phase	Click “Refresh”, the antenna will automatically collect the environment data and upload the calculated phase value.
Debug Phase	Use mouse to move the phase value and make the above right line of red block and black block in the same line.
Function Key	
CH	Select a channel for debugging.
Refresh	Select the corresponding phase channel and click “Refresh”.The antenna will collect the surrounding environment data and upload it for system

Sync Steps:

Systemsynchronization:
Sync with other suppliers’ devices and the environment,as follows:
1) Click to display signal interference strength
2) Click to refresh the surrounding environment and choose channels to find a cleaner channel. If the channel signal is very large, you can select one of the antennas to reduce the sensitivity of the hardware (J10) on the slave board, and then set it back to the original state after the synchronization is over.
3) Calculate the phase difference between the local unit and the surrounding equipment.
4) Add the phase different value into the “Phase” in Parameter Interface.
5) Move the debug phase by left and right to make the above right line of red block and black block in the same line. Until the best phase value is obtained, the noise and signalsareminimal.
6) Stop the signal strength display.

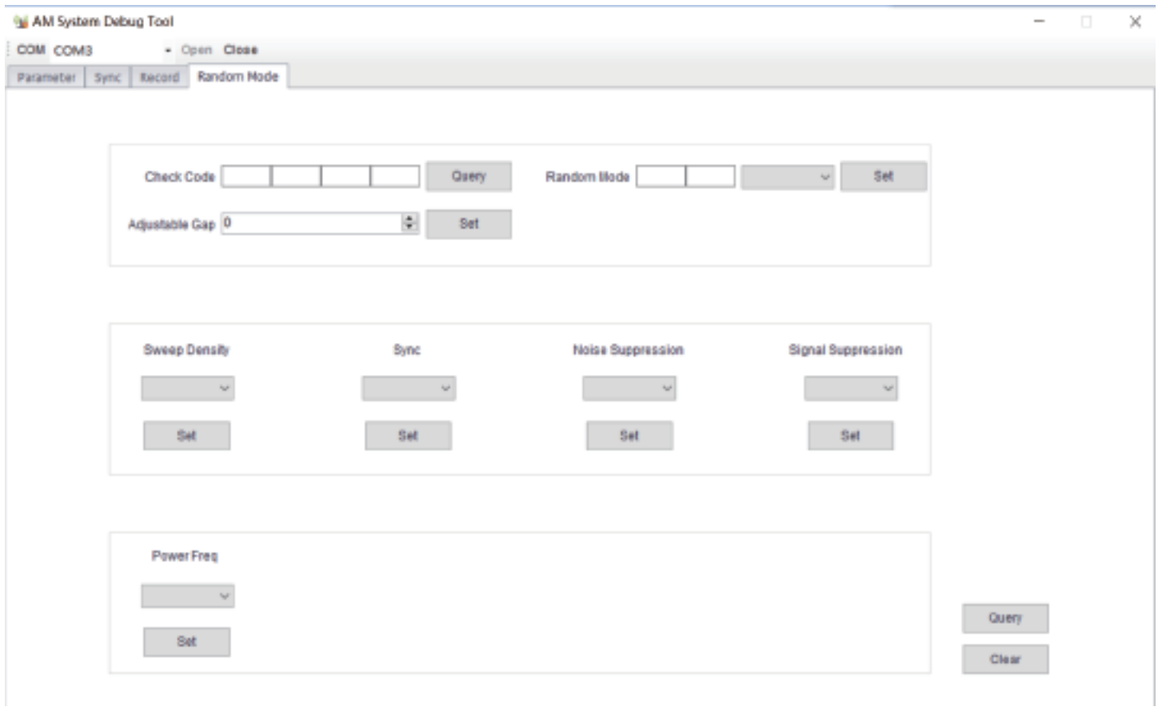
	synchronization.For the convenience of system synchronization,please select the channel with the best signal for debugging.If the channel signal interferenceis very large,you can select one of the antennas,reduce the sensitivity of the hardware (J10) on the slave board,and set it back to the original state after the synchronization is over.	7) The phase value to be sent is sent to the host through the parameter setting window, and the parameters are saved.
AC Freq	Choose 50HZ or 60 HZ according to local power voltage.	
Display	Click the “Display” button,the antenna will automatically upload the channel signal and background noise.	
Stop	Click “stop” after debugging.The obtained phase is transmitted to the system through the parameter setting interface and saved.	
Left---Right	Shift “Left” and “Right” buttons of the debug phase.The software will shift the phase of one scale to the left or right and send it to the antenna.The antenna will adjust after “Set“.	
Set	If you use the mouse to pull the phase scale to a new scale,click the "Set" button, otherwise the software will not pass this value to the board.	

3.4 Alarm Records



Record Type	
CH1/CH2/CH3 Alarm	Recorded when the antenna alarms
System Power on	System Power on Recorded when the antenna power on
Setted New Parameter	When any parameter changes was saved
Hour Tick	Time punch per hour
Power frequency phase failure	When the power supply is unstable
Channel Signal	
Clear	Click "clear" to clear the screen
Query	Clic kQuery to display the antenna record data and save up to the last 255 records.
Save	Click "Save" to save the record to a txt file.

3.5 Random Mode



This Random Mode, only works with Emeno latest AM100 mainboards, and the function only can be used under Emeno engineer guide.

Parameter Name	Settings
Check Code	Click“Query” to show the CheckCode
Random Mode	Set under the help of Emeno Engineer
Adjustable Gap	Set under the help of Emeno Engineer
Sweep Density	Set under the help of Emeno Engineer
Sync	Set under the help of Emeno Engineer
Noise Supperession	Set under the help of Emeno Engineer
Signal Suppression	Set under the help of Emeno Engineer
Power Freq	Choose 50Hz, 60Hz according to local power voltage, after choose it, the system won’t detect power source, this function is used when the power source is not stable and cause system alarms, like the store use USP or generate power.
Function Key	
Query	If the system is with latest AM1000 mainboards, Click “Query” to show the default data from the system.
Clear	Clear the settings
Set	Set the settings

04/ Common Malfunction Analysis

NO.	Conclusion	Fault Phenomenon	Analysis and Solution
1	Hardware Malfunction	System not start	Check whether the fuse is burn and the power voltage is 110v or 220v, change the power supply unit
2	Hardware Malfunction	No transmitter signa	Listen carefully to check whether the transmitting antenna has a soft vibration when transmitting, or use an inductive electric pen to test whether there is an electromagnetic field around the antenna. If not, it may be a malfunction of the transmitting motherboard. Change the master board.
3	Hardware Malfunction	No alarm: no alarm even if the label is placed very close (label should be good and tested on other system)	See if the indicator light is under normal work or not, check if the connection cables include 9pin cable, 5pin cable, and network cable are firmly connected. Fix each connection socket.
4	Hardware Malfunction	Red light Indicator	Factory Reset
5	Hardware Malfunction	Antenna beeps spontaneously, not alarm sound.	Re-plug the 9 pin cable which connect the master and slave antenna. Try to screw down the screw on the 9 pin cable. Use 0.3cm/05cm wire to connect the 9 pin cable’s red and black pin holes of two heads.(ask for video guide from Emeno engineer) change a new 9 pin cable.
6	Hardware Malfunction	one slave antenna is not working	a> Check labels or tags around the antenna b> Move the label-attached products away from the antenna c> Turn off the RX of the slave antenna
7	Hardware Malfunction	There is no signal detected show on the LED and the software	re-plug the RX on the slave board
8	Hardware Malfunction	The system won’t work properly due to couldn’t synchronize with the surrounding signal	Turn on the random mode
9	Hardware Malfunction	The system won’t work after we successfully installed them earlier	a> Check the sync for new surrounding phase b> Check the surrounding for construction, the construction will interference the system due to high power machine, it will be back to normal once the construction is over
10	Hardware Malfunction	The RF system encounter the issue which won’t work with 1 TX and 2 RX, but it works under 1 TX and 1 RX	Change the TX’s motherboard
11	Hardware Malfunction	RF system have low detection range	Higher the sensitivity
12	Hardware Malfunction	RF system has heavily noise interference.	Lower down the sensitivity on the board
13	Power Problem	The noise value is too high, the sensitivity is low, and there are occasional false alarms.	Check if the power supply connect the ground wire
14	Power Problem	Two channels use the same power supply, one channel. High sensitivity, but low sensitivity in other channel	Check if the position of the neutral line and the fire line are opposite. Change the power connection, or set in our software @ Slope: Rising to Falling in parameter settings
15	No Detect Tags	Observe the indicator light on master board, the lower row of indicators is fully illuminated	Check if there are tags nearby, move the soft label 1.5 meter away, move the large tags 2.0 meter away
16	No Detect Tags	the master antenna has been heavily interfer-enced by noise.	Turn off the master’s RX and slave’s TX.
17	False Alarm	There are large metal objects around the antenna (such as metal shopping carts, lockers, umbrella racks, etc.). Metal objects close to the antenna cause distortion of the detection signal, increase the noise value, reduce the detection distance, and cause interference to the antenna.	Remove large metal objects until false positives are eliminated
18	False Alarm	There are a lot of spotlights and fluorescent lamps near the antenna. and false alarm when turned on	The starter of spotlights and fluorescent lamps is close to 58KHZ, which interferes with the antenna. Replace the starter for spotlights and fluorescent lamps
19	False Alarm	There are asynchronous magnetic and magnetic devices around the antenna. When it is out of sync with other aeromagnetic devices, system false alarms are easy to occur.	Increase sensitivity and synchronize by software debugging
20	False Alarm	Soft labels or hard labels are too close to the antenna. When the label on the checkout counter or clothing store closet is too close to the antenna, a system false alarm will occur.	The additive effect of the tag signal, moving the tag to a greater distance
21	False Alarm	No interference source around, it still false alarms	a> Check the surroundings for labels or tags. The soft label should keep from the system over 1.5M, hard tag should keep from 1.8M b> Lower the TX power on the software c> Try turn up the threshold

22	Missing Alarm	The system missing report	1 Check if the system synchronized with the surrounding 2 Try to exclude the environment's interference by turn off the suspicious subject one by one, like the LED, decoder, amplifier, ect. 3 try higher the TX power in the software and turn up the sensitivity level on the slave board.
23	Missing Alarm	The soft label is being shield when it attached to a card	Add a tape on the card to segregate the card and label
24	Missing Alarm	The system won't work even the software and the LED on the board show the noise level is low	Check if the surrounding have large piles of cloth which have tags on it.
25	Can't synchronized	When you install a serial of antenna in one store, only one set can't be synced	Change the slope from default rising to failing
26	Can't synchronized	The synchronization area shows many random signal, make it impossible to synchronize	Turn off the other system and synchronize it one by one
27	Noisy Surrounding		a> Check if the system is synced. If not, synchronize the system with surrounding. b> Exclude the surrounding c> Change the TX mode to mode 3 d> Lower the TX power or the sensitivity e> Move the system a little bit, sometimes change the location a little will bring great help. f> Shorten the distance of the aisle.
28	Noisy Surrounding	What can we do if we can't lower down the surrounding noise?	Shorten the distance between the antennas. Move the system a little bit, sometimes change the location a little will bring great help. Using the larger size hard tags