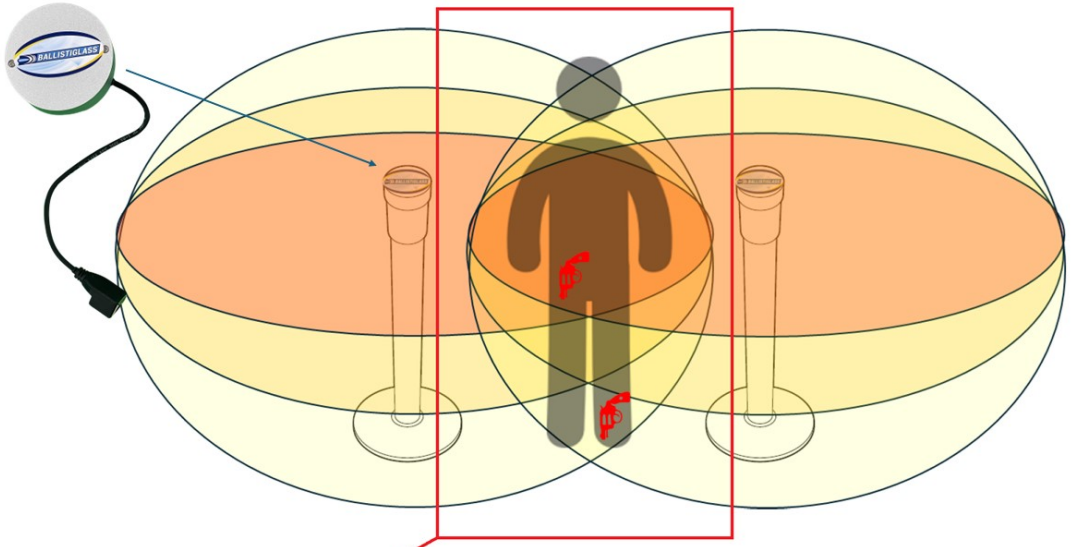
TURNSTILES.us

BALLISTISCAN (V3)
Installation/Operation Manual

Version 1.1 2024-08-05



BALLISTISCAN sensors detect a field approximately 3 feet out from the sensor (yellow). Reporting is focused on the overlapped region that is common for both sensors (middle). Red is most sensitive area of detection.

- Before installing and using BALLISTISCAN, please read this manual carefully.
- Be sure to keep it handy for future reference.
- The contents of this manual are subject to change without notice to improve quality.

Safety Information

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK)
NO USER SERVICEABLE
PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

Warning

This symbol indicates that dangerous voltage consisting a risk of electric shock is present within this unit.

Precaution

This exclamation point symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING

1. Be sure to use only the standard adapter that is specified in the specification sheet. Using any other adapter could cause fire, electrical shock, or damage to the product.
2. Incorrectly connecting the power supply or replacing battery may cause explosion, fire, electric shock, or damage to the product.
3. Do not connect multiple systems to a single adapter. Exceeding the capacity may cause excessive heat generation or fire.
4. Securely plug the power cord into the power receptacle. Insecure connection may cause fire.
5. When installing the sensor unit, fasten it securely and firmly. A falling sensor may cause personal injury.
6. Do not place conductive objects (e.g. screw drivers, coins, metal items, etc.) or containers filled with water on top of the product. Doing so may cause personal injury due to fire, electric shock, or falling objects.
7. Do not install the unit in humid, dusty, or sooty locations. Doing so may cause fire or electric shock.
8. If any unusual smells or smoke come from the unit, stop using the product. Immediately disconnect the power source and contact the service center. Continued use in such a condition may cause fire or electric shock.
9. If this product fails to operate normally, contact the nearest service center. Never disassemble or modify this product in any way.
10. When cleaning, do not spray water directly onto parts of the product. Doing so may cause fire or electric shock.

Precaution

Operating

- Before using, make sure power supply and all other parts are properly connected.
- While operating, if any abnormal condition or malfunction is observed, stop using the sensor system immediately and contact your dealer.

Handling

- Do not disassemble or tamper with parts inside the sensor unit.
- Do not drop the sensor or subject it to shock or vibration as this can damage the sensor.

Installation and Storage

- Do not install the sensor in areas of extreme temperature, exceeding the allowed range.
- Avoid installing in humid or dusty environments.
- Avoid installing in places where radiation is present.
- Avoid installing in places where there are strong magnetic fields and electric signals.
- Avoid installing in places where the sensor would be subject to strong vibrations.
- Never expose the sensor to rain or water.

REMOVE BATTERIES WHEN NOT IN USE

Important Safety Instructions

1. Read these instructions. - All these safety and operating instructions should be read before the product is installed or operated.

2. Keep these instructions. - The safety, operating and use instructions should be retained for future reference.

3. Heed all warnings. - All warnings on the product and in the operating instructions should be adhered to.

4. Follow all instructions. - All operating and use instructions should be followed.

5. Do not use this device near water. - For example: near a bath tub, wash bowl, kitchen sink, laundry tub, in a wet basement; near a swimming pool; etc.

6. Clean only with dry cloth. - Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners.

7. Do not install near any heat sources such as radiators, heat registers, or other apparatus (including amplifiers) that produce heat.

8. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

9. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

10. Only use attachments/accessories specified by the manufacturer.

11. Use only with cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

12. Unplug this apparatus during lightning storms or when unused for long periods of time.

13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Disposal of Old Appliances

1. All electrical and electronic products should be disposed of separately form the municipal waste in accordance to laws designated by the government or the local authorities.

2. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.

3. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product.

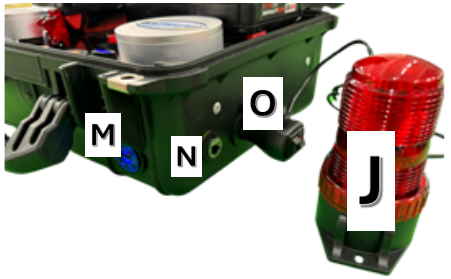
Table Of Contents

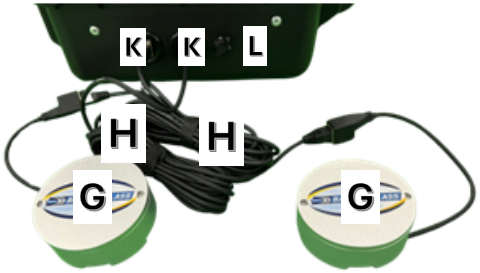
1 THE BALLISTISCAN

Please check if the BALLISTISCAN system and accessories are included in the package.

INCLUDED WITH BALLISTISCAN:

ITEM	QUANTITY	DESCRIPTION
A	1	POWER SWITCH W/COVER
B	2	18V MILWAUKEE BATTERY
C	1	TOUCH SCREEN
D	1	WI-FI/ROUTER POWER SWITCH
E	1	RED ALARM LIGHT (R2)
F	1	12V VOLTMETER
G	2	MAGNETIC ANOMALY SENSOR
H	2	ETHERNET CABLE (RJ45, CAT 6)
I	1	110/220V AC TO 12V DC ADAPTOR
J	1	RED ALARM STROBE LIGHT (R1)
K	1	SENSOR CABLE PORT
L	1	WALL POWER PORT
M	1	DUAL USB CHARGING PORT
N	1	ETHERNET DATA PORT
O	1	PORT FOR RED ALARM STROBE LIGHT (R1)
P	1	4-DIGIT CODE TSA-LOCK





REQUIRED - USER SUPPLIED ITEMS: VISIT LINK BELOW OR SCAN QR CODE TO PURCHASE ON AMAZON.COM:

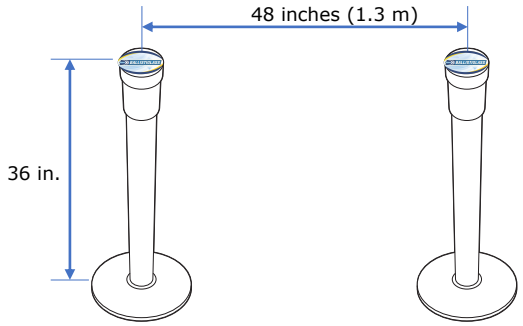
https://www.amazon.com/hz/wishlist/ls/1YJ94KXDFCOQ7?

2 Installation of BALLISTISCAN System

Step 1. Install BALLISTISCAN Sensors

Install two sensor heads of the system **on the barrier poles** as in figure 1.

- Two sensors must be fixed on the solid pillar which is stationary.
- The setup distance between two sensors is **48 inches (1.3 m)**.
- The vertical position of two sensor is about 36 inches (**0.9 m**) from the floor.

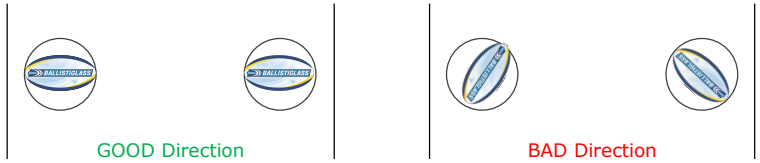


<Figure 1. Installation of two Sensors>

- Wider setup distance needs more sensitive setting of the system as follows:

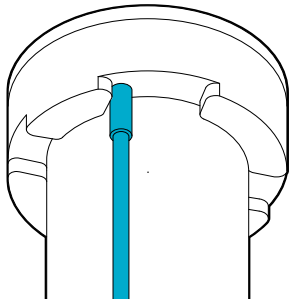
Distance between two sensors	Recommended Sensitivity
48 in.	5
51 in.	6
54 in.	8

- The direction of two sensor heads should be the same oriented towards the passageway.(figure 2. Please refer the sticker on the top plate of the sensor.)



<Figure 2. The direction of the two sensor heads>

- The sensor cable can be hidden inside the pole (figure 3. The cable is pointing down.)



<Figure 3. Bottom of TP Sensor>

SENSORS CAN BE PERMANENTLY BUILT INTO WALLS - EVEN BEHIND METAL.

2 Installation of BALLISTISCAN System

This is the BALLISTISCAN Controller Box

Step 2. Connect the sensors to the BALLISTISCAN controller

There are two Ethernet-type ports on the controller box. for connecting the two BALLISTISCAN sensors. Each sensor should be connected to a port via the supplied cables*. NOTE: Make sure the power is off while connecting the cables. Left and Right do not matter. Either sensor can connect to either port. BALLISTISCAN looks at the signal that is common between the two sensors.

*YOU MAY SUPPLY YOUR OWN "ETHERNET" RJ45 CAT6 CABLES. THE MAXIMUM LENGTH IS 75 FEET (23 METERS).

Step 3. Turn on the BALLISTISCAN - 2 METHODS

Method 1: Connect the power adapter (DC12V, 2A) and turn on the system using the POWER SWITCH by pulling the switch down towards you. The red lid, when closed, will push the switch down. Method 2: Connect one or two charged 18V Milwaukee batteries and turn on the system using the POWER SWITCH by pushing the switch away from you. **The red lid must be up.**

Step 4. (As needed) Modify the alarm thresholds or sensitivity of the sensors.

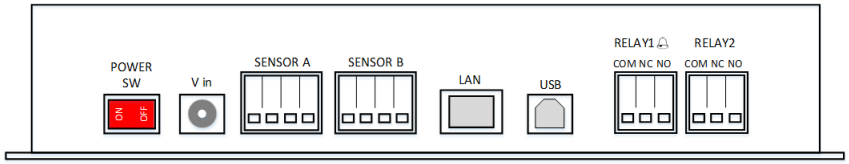
BALLISTISCAN has two RELAYs, and two signal THRESHOLDs for each..The user can easily adjust each threshold by the button on the touch panel. For example, the User can operate an extra alarm light by RELAY 1, and simultaneously send a alarm signal to main control center by RELAY2. Two thresholds can be adjusted freely and separately.

[Optional]

Step 5. Connect to the BALLISTISCAN APP on a PC

When the blue switch is on, the BALLISTISCAN will have its Wi-Fi radio broadcasting a secure access point with the name BSCAN_XXXX

3 Components on a BALLISTISCAN Controller



<Figure 5. Components of a BALLISTISCAN Controller>

<Table 1. Description of the components on the BALLISTISCAN controller>

Name	Description
Power S/W	The switch is to turn on and off the whole system.
V in	Power input, User should use **DC 12V, 2A** adapter.
Sensor A & B	Each sensor is connected to this socket respectively.
LAN & USB	User can connect with PC using USB or LAN.
RELAY 1	This dry switch will be ON(**COM - NO terminals are connected**) when the signal over the **threshold 1.** The internal **buzzer** is connected to the **threshold 1**.
RELAY 2	This dry switch will be ON(**COM - NO terminals are connected**) when the signal over the **threshold 2**.

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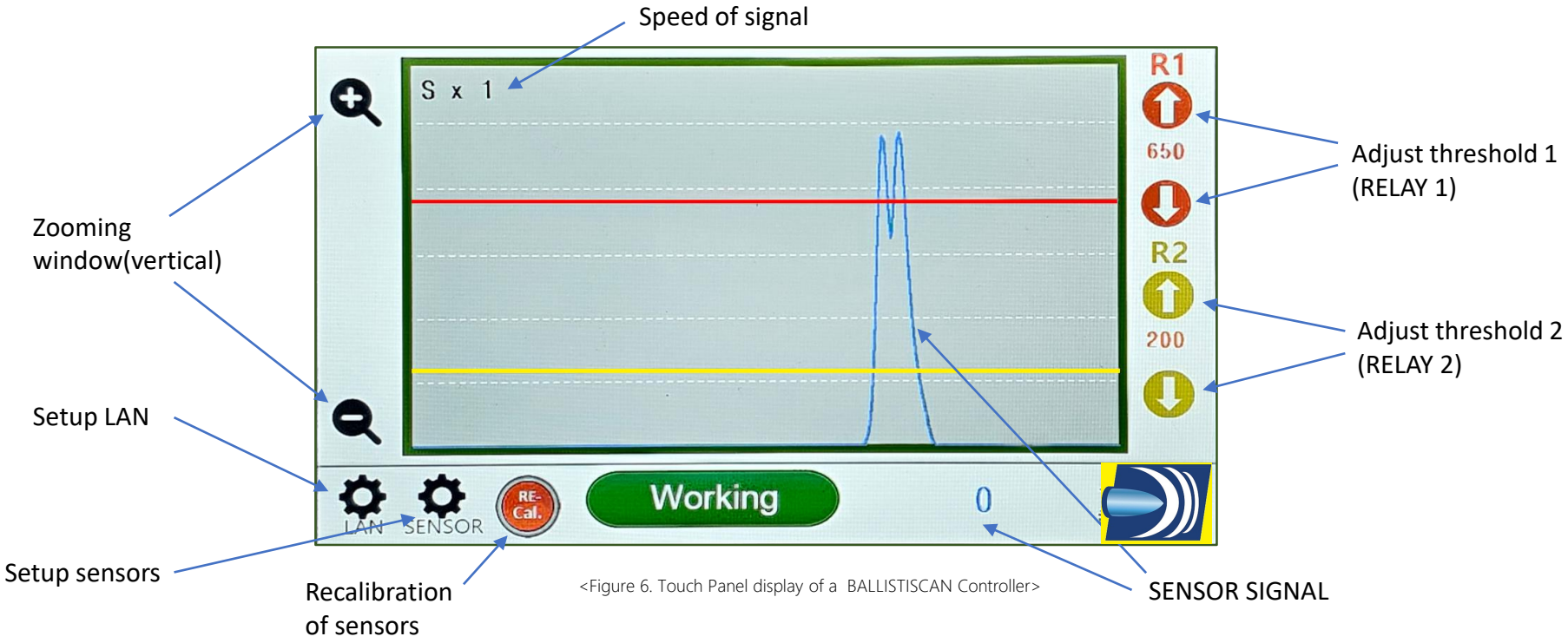
4 Setup of BALLISTISCAN

4.1 Touch panel display of BALLISTISCAN

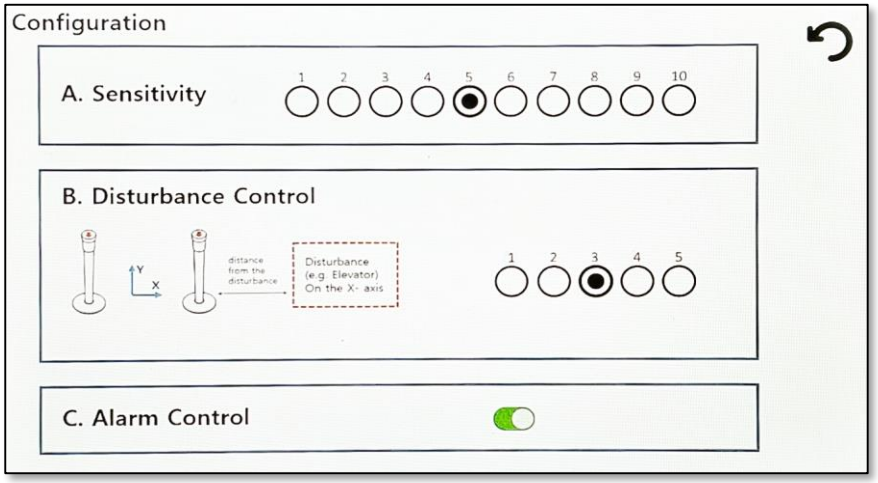


<Figure 6. Touch Panel display of a BALLISTISCAN Controller>

- The amplitude of the SENSOR SIGNAL means roughly the size of an iron object that passes through.
- User can use two relays connected to threshold 1 and threshold 2 respectively.
- The terminal of COM and NO on RELAY will be connected internally when the SENSOR SIGNAL over the threshold.
- The internal buzzer is synchronized to the threshold 1 and RELAY 1.
- Please operate the button of RE-CALIBARATION when the temperature changes or when deemed necessary.
- User can adjust the flow speed of the signal by touching near the character (S x 1).

4 Setup of BALLISTISCAN

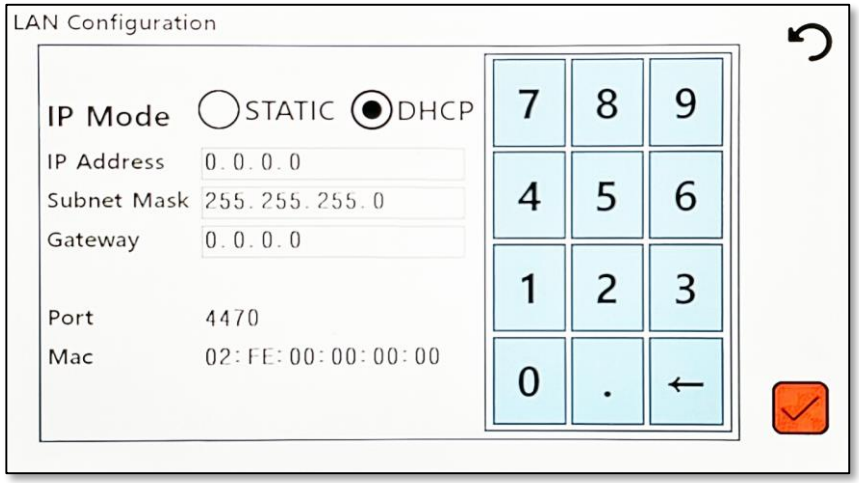
4.2 Setup of magnetic sensors



<Figure 7. Sensor Configuration>

- **Sensitivity(default value=5)**: This button selects the overall sensitivity of the system. **10** is the most sensitive. If user want to widen the passage width(up to 1.4m) then higher sensitivity should be selected.
- **Disturbance control(default value=3)**: A source of magnetic noise(e.g. elevator) orthogonal the passage can be weakened by this function. If there is no noise source, then place this button on **3**(default).
- **Alarm Control**: ON or OFF the internal buzzer (synchronized to RELAY 1)

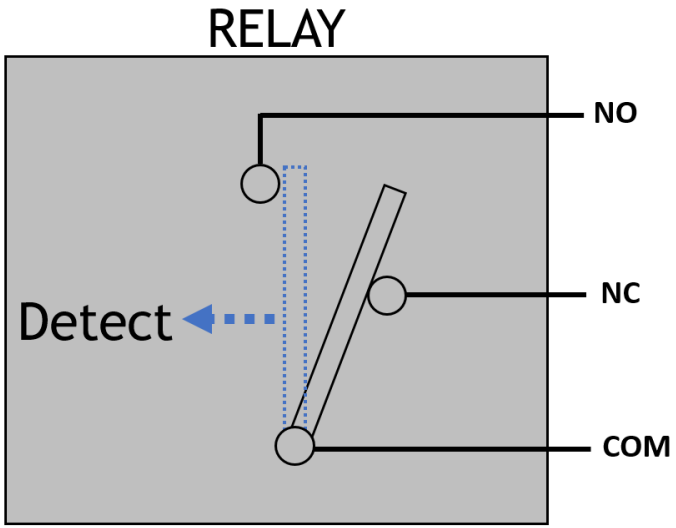
4.3 Setup of LAN Connection



<Figure 8. LAN Configuration >

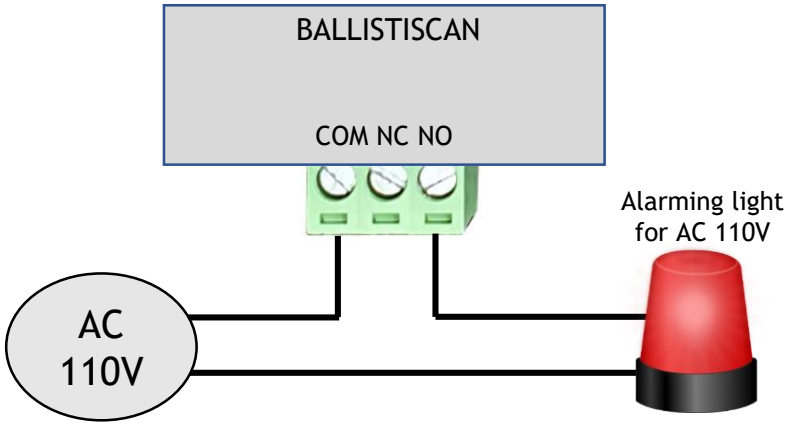
- Connect **TP** to your router or access point by a LAN cable first(necessary.)
- User can setup the LAN configuration in this menu. If the **STATIC** button is selected, then user can input manually **IP Address**, **Subnet Mask** and **Gateway**.
- Push the **RED CHECK BUTTON** to apply the setting after all parameters input properly.

4.4 Connection of the RELAY for an external device

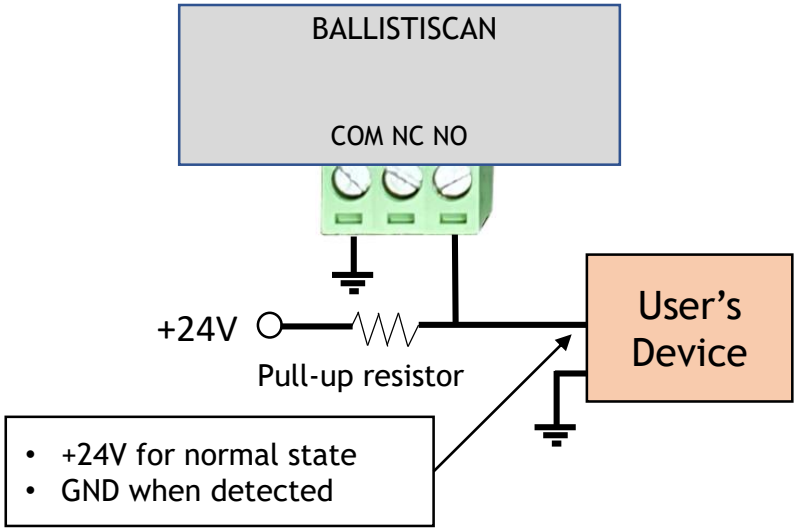


<Figure 9. Operation of a RELAY >

- The terminal of **COM** and **NO** will be connected internally when the signal **exceeds** the threshold.
- **BALLISTISCAN** has **two** RELAYs which can be configured to the user's preference.
- See figures 10 & 11 for examples.



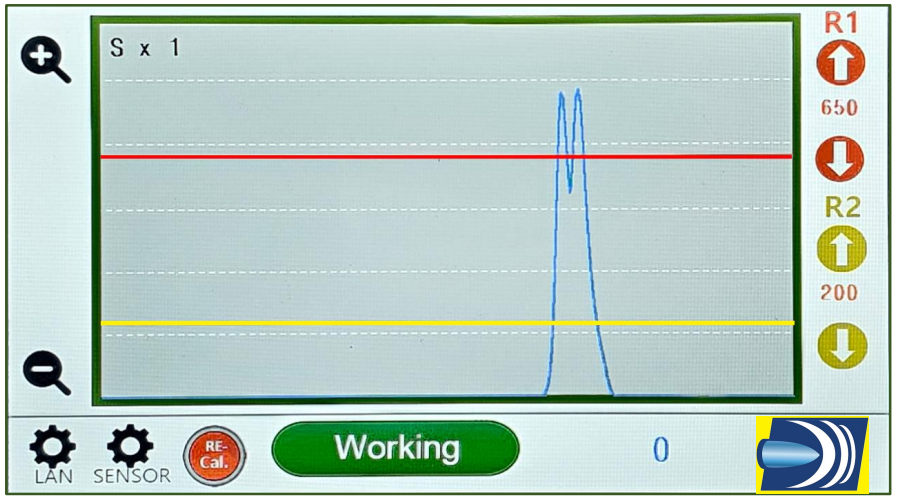
<Figure 10. Connection of an alarming light >



<Figure 11. Connection to an user's device >

5 Using a BALLISTISCAN system

5.1 Turn on the power and run the system



<Figure 12. Touch Panel display of a TP Controller>

Step 1. Power-ON the system

1. Turn on the power switch located under the red protective cover.
2. Adjust the value of **THRESHOLD 1** and **THRESHOLD 2** by up/down buttons for the user's purpose.
3. Please give a few minutes (5 - 7) for the system to reach a steady state temperature between environment and sensor cases.
4. After power-on, the lower display shows the current status of the system;
   Calibrating →Calibrating A & B →Working
   (Normally the initial calibration process takes under 30 seconds, and during the first few minutes , it may have several calibrations according to ambient temperature vs sensor differential.)

- ☑ Align the **direction of the two sensor heads (see page 7).**
- ☑ Do not expose the sensor heads to **sudden changes** of temperature.
- ☑ Do not touch or shake the sensor heads when operating your BALLISTISCAN.

Step 2. Check the signal of visitor possessions

1. The amplitude of the SENSOR SIGNAL is proportional to the **size of an iron object** that passes between the sensors.
2. If the signal go over **THRESHOLD 1** then **RELAY 1** will be activated. If the signal exceeds **THRESHOLD 2** then the **RELAY 2** will be activated. Each RELAY works independently. The internal buzzer is connected to **RELAY 1**.
3. The system automatically **re-calibrates** when the temperature changes, so it might often re-calibrate in the beginning of operation, but as time passes, the interval between re-calibrations will be much less frequent.
4. Please re-calibrate **manually (red RE-Cal. button)** if the **environment is changed abruptly** (i.e. temperature or magnetic noise.)

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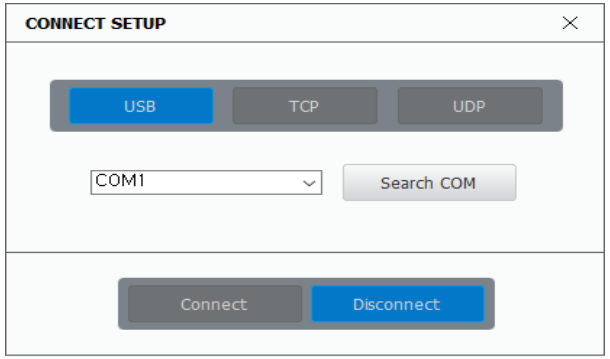
6 BALLISTISCAN PC Software (optional)

6.1 Connection to an external PC



<Figure 13. Screen of the CONNECTION menu>

- ☑ BALLISTISCAN system can be connected to user's personal PC using or LAN by ethernet cable or Wi-Fi. (optional)
- ☑ The threshold and alarm of the PC S/W(BALLISTISCAN APP) were designed separately with two RELAYS in the control box of BALLISTISCAN.

Step 1. Run the PC S/W

1. Run the BALLISTISCAN S/W (V4.1 or later) on your PC to check the signal from BALLISTISCAN.

Step 2. Set up the connection mode

1. Push the "CONNECT button and run connection menu.
2. For using a USB port, choose the number of serial port(e.g. COM1) that is connected to the BALLISTISCAN system in the PC, and press the button of CONNECT.
3. For using LAN system, just press the button of CONNECT when you use the default IP address, and if you changed the IP address then modify it and press the button.

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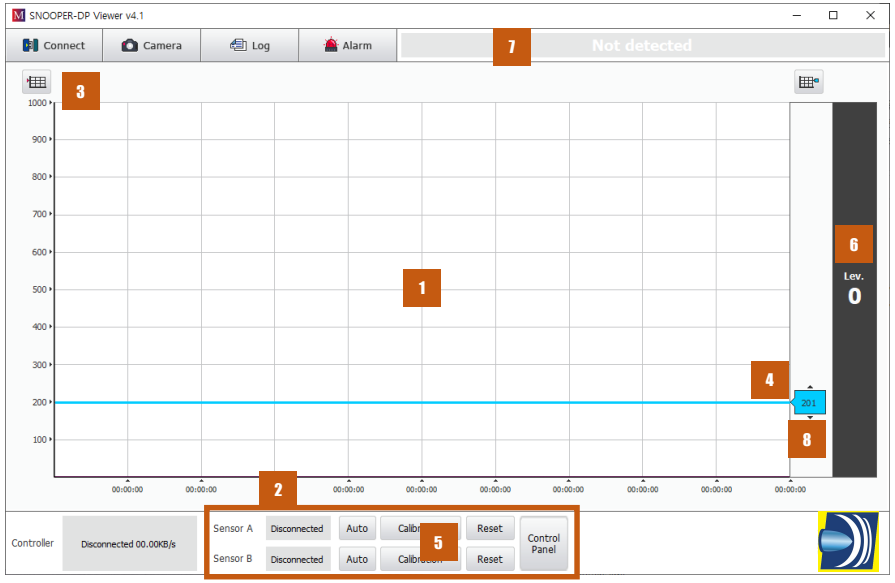
6 BALLISTISCAN PC Software (optional)

6.2 Control with the PC BALLISTISCAN S/W



<Figure 14. Main Screen>

Step 3. Check the main window

1 After all the above setup process, the BALLISTISCAN S/W. will show the signals from the BALLISTISCAN system on real time.

No.	Name	Description
1	Realtime data graph	The size and position of the target object are shown on this real time graph.
2	Sensor State	This box shows the information of the micro magnetic sensors.
3	Window Size(Y axis)	Adjust the maximum value of the graph Y.
4	Threshold control	User can set the threshold value of the graph by dragging the button or double-clicking.
5	Sensor calibration	If the system margin is low, user can re-calibrate sensors by this button (If the **Auto** button is pressed, the program will automatically re-calibrate.)
6	Detection level	Shows the value of the detected object (Level 1-8). (This level is the manufacturer's selection of sections that users frequently use.)
7	Detection Alarm	This box flashes red when the sensor detects an object.
8	Threshold value	It shows the threshold value and can be adjusted by double clicking.

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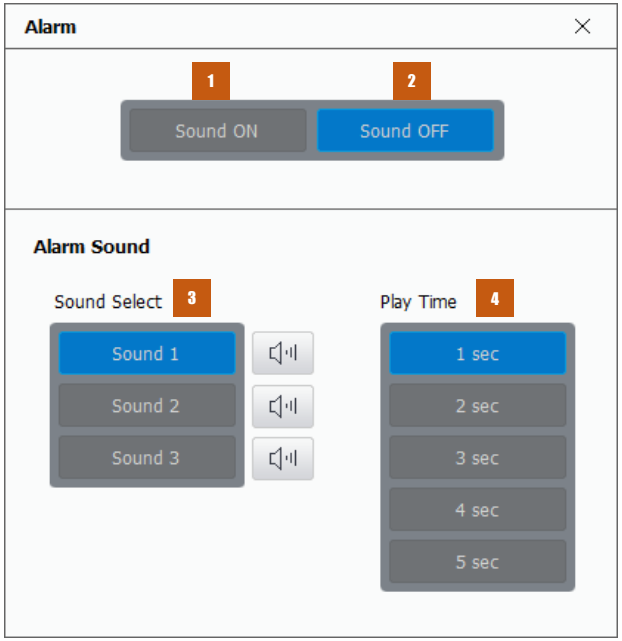
6.2 Control with the PC BALLISTISCAN S/W



<Figure 15. Screen of the Alarm SETTING menu>

Step 4. Set the user's parameters

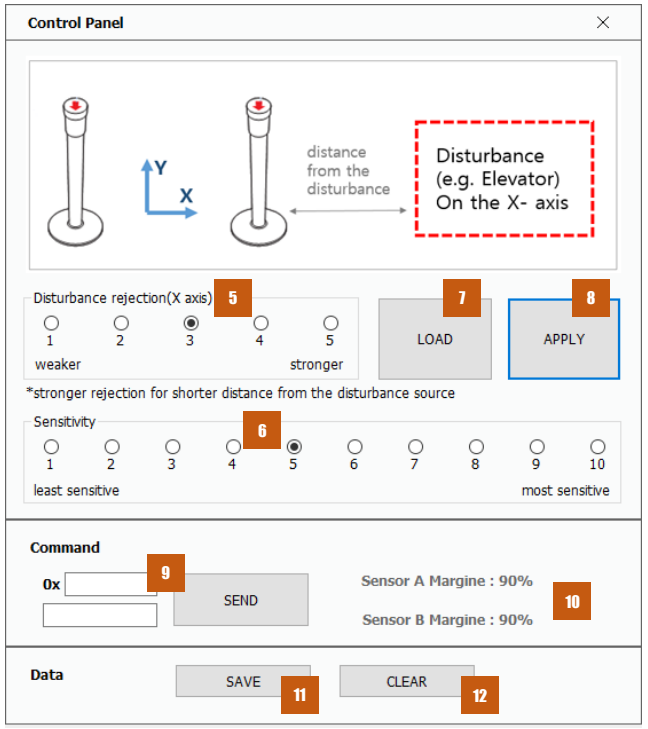
1 Set the threshold and other parameters as user's preferences.

No.	Name	Description
1	Alarm Sound ON	Turn on the alarm sound.
2	Alarm Sound OFF	Turn off the alarm sound.
3	Sound Select	User can select and save the alarm sound. The 'User sound' function allows you to use any wav file.
4	Set play time	Set the alarm operation time.

6 BALLISTISCAN PC Software (optional)

6.2 Control with the PC BALLISTISCAN S/W

<Figure 16. Sensor SETTING menu>

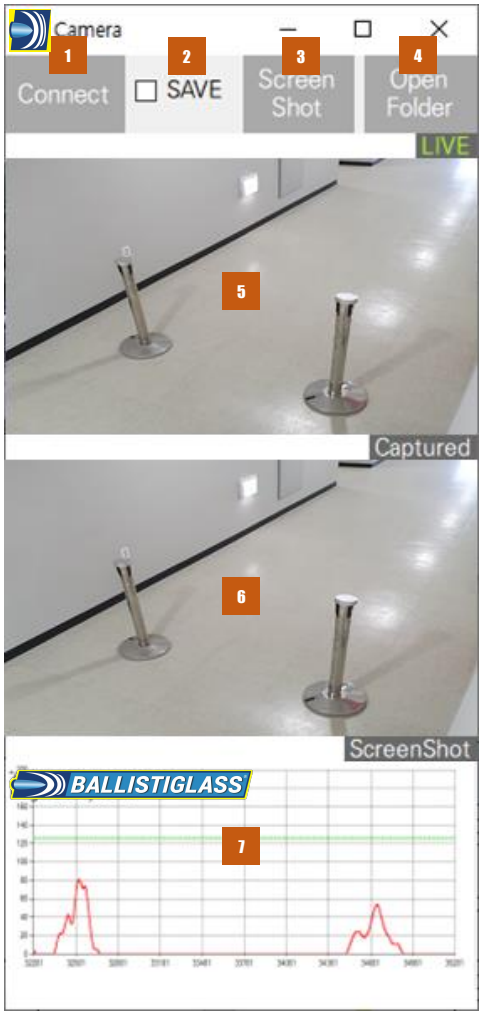


<Figure 17. Sensor Control Panel>

Step 5. Control sensors

No.	Name	Description
1	Auto	This button enable the function to re-calibrate automatically the sensor according to the change of temperature.
2	Calibrate	Manually re-calibrate the micro magnetic sensor
3	Reset	Reset the sensor.
4	Control Panel	Open the control panel window(Fig. 11).
5	Disturbance Rejection	If there is a source of magnetic disturbance (e.g. elevator) on the direction of X-axis, a stronger number will be helpful to compensate it.
6	Sensitivity	Adjust the overall **sensitivity** of the sensor (**10** is most sensitive)
7	Load	Load the parameters of **disturbance rejection** and **sensitivity** from the EEPROM.
8	Apply	Activate the parameters of **disturbance rejection** and sensitivity
9	Command input	Transfer a manual command
10	Margin	Calibration margin of the sensor. If this value go below 40% then please re-calibrate the sensor
11	Save	Save the sensor data stream to file
12	Clear	Clear the buffer for saving data

6.2 Control with the PC BALLISTISCAN S/W



<Figure 18.
Screen of the CAMERA menu>

Step 6. Camera setting

No.	Name	Description
1	Camera Connect	Connect to a USB camera or an IP camera.
2	Camera Save	The application will save three of pictures when the output signal is over the threshold if this check box is enabled.
3	Screen Shot	Screenshot camera and graph
4	Open Folder	Open application folder
5	Camera Live	A Live camera streaming is on this area.
6	Camera Capture	This screen shows the pictures taken when BALLISTISCAN data is over the threshold.
7	Graph	Graph captured screen

* Double-click to view the full size of the screen.

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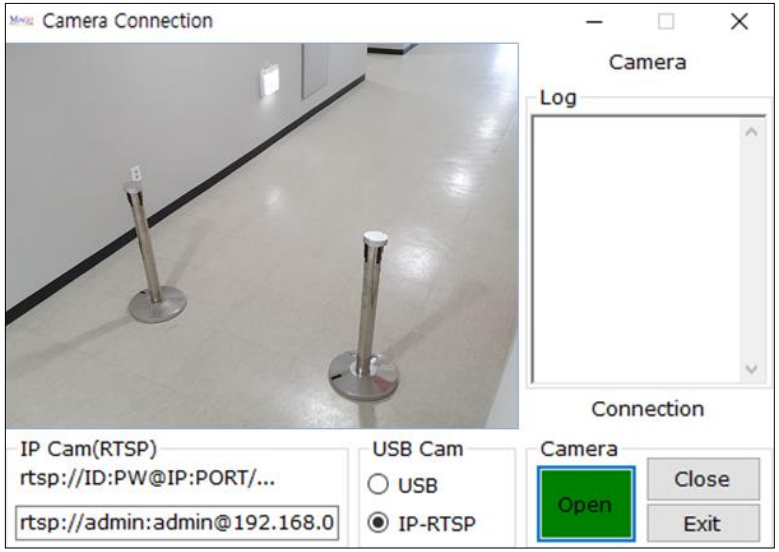
6.2 Control with the PC BALLISTISCAN S/W

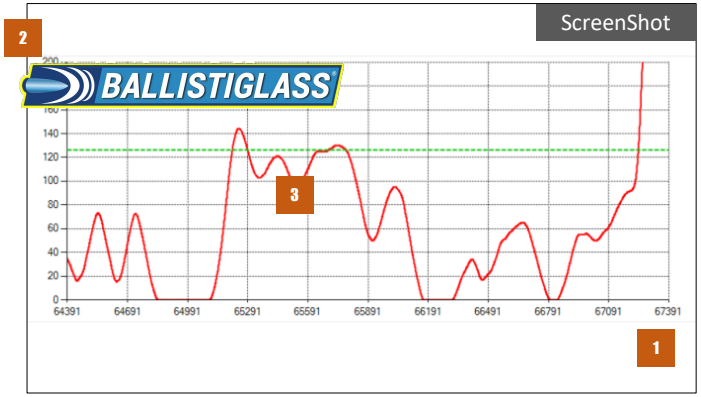


<Figure 19. Camera Connect>

Step 6. Camera setting

- User can connect a USB camera or IP camera to this application.
- This application takes pictures when BALLISTISCAN data is over the threshold.
  - User can see a live picture on the screen.
  - This application takes 3 pictures and a data graph when output is over the threshold (intervals between pictures are 300ms)
  - The captured pictures will be saved by checking 'Save.'

6.3 Signals on Real Time Graph



<Figure 20. Signals on Real Time Graph>

Step1. Signals on Real Time Graph

No.	Name	Description
1	Axis-X	Displays time value (one packet period is about 6ms typically.)
2	Axis-Y	shows sensor data (click right button of mouse to adjust the scale)
3	The red line	Displays the amplitude of the signal for the target object.

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6.4 Messages on the STATE Window

<Figure 21. Sensors STATE>

<Table 2. Message of the sensor state>

Message	Detail
Disconnected	Sensor X is disconnected.
Connected	Sensor X is working in normal operation.
Calibrating	Sensor X is on calibrating.

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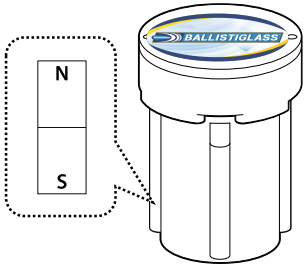
7 Trouble Shooting

1. Magnetic Calibration process

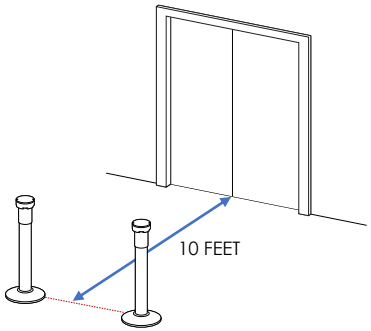
- If the calibration process of a sensor module does not finish within 30 seconds, check for strong magnetic materials near the sensors.
- For example, (rarely) some of the barrier poles have a magnet inside the belt tensioner.



<Figure 22. Check magnetic materials near the sensor>

2. An iron door or elevator near the sensor

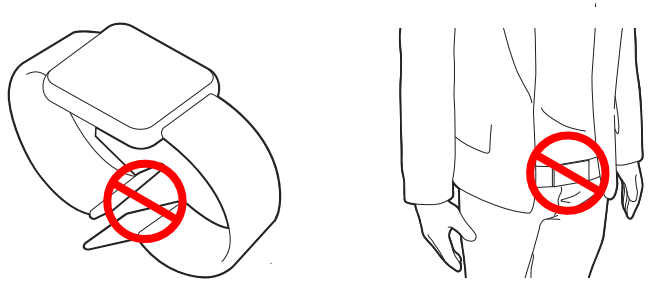
If the movement of the steel door or elevator near the sensor causes disturbance, please move the sensors at least 10 feet away.



<Figure 23.BALLISTISCAN installation near an elevator.

3. Magnetic buttons or ornaments

- If a magnetic object is attached to the user's clothing, BALLISTISCAN may detect this as a false positive.
- Some shoes have iron skeleton inside the bottom.



<Figure 24. Magnetic ornaments may cause the perturbation of the magnetic field>

4. Do not open the sensor cover

OPENING THE SENSOR COVER creates temperature changes and random disturbances, so DO NOT OPEN the sensor cover.

8 BALLISTISCAN Specifications

1. Introduction

- BALLISTISCAN is an innovative and stealthy solution for detecting a HIDDEN METAL OBJECT inside a pocket or bag **without body check** for the visitors.
- The system can detect CONCEALED WEAPONS such as knives and rifles made of ferrous (iron) materials.
- BALLISTISCAN has an advanced algorithm to **compensate** for magnetic disturbances from large moving metal objects such as an **ELEVATOR** or a **BUS** near the system.
- Sensor modules of the system are designed to be installed **on standard barrier poles**.
- BALLISTISCAN system can be set up easily with a notebook PC or it can be connected to the user's security system by the standard Ethernet LAN.

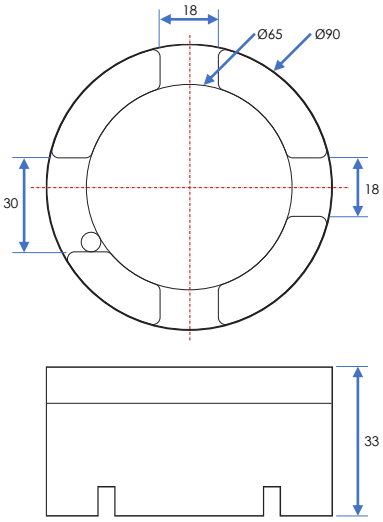
2. Specifications of BALLISTISCAN

<Table 3. Specifications>

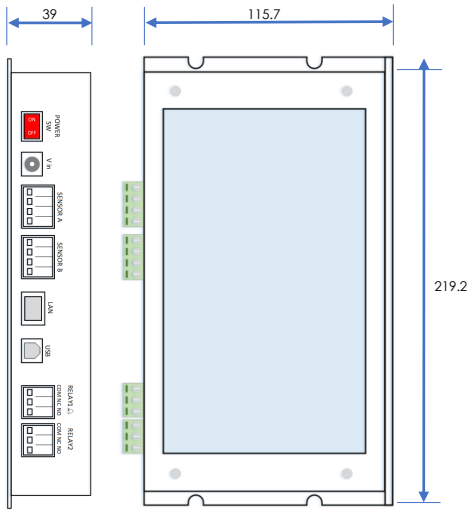
	Value	Note
Input	DC12V	Use 2A adaptor
Output	USB & Ethernet	Digital data communication
Sensor	2	Two micro magnetic sensors
Controller	1	Controller
Operation Temp.	14F - 122'F	Industrial Spec.

3. Sensor Case Dimensions

Units: mm



<Sensor Head>



<Controller>