Library Security Pedestal 3A Clear User's Guide

Revision 1.0

Invengo Information Technology Co.,Ltd.

Publishing Information

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Read This First

Welcome to the INVENGO LSP3A Electronic Article Detection system. This user's guide is designed to help you get up and running quickly using this high-quality Radio Frequency Identification (RFID) Anti-Theft system. It describes all you need to know about how to install and use the INVENGO EAS/AFI system and its associated applications.

It provides a step-by-step guide for the following procedures:

- Installation of the LSP3A EAS/AFI Detection and RFID Data Retrieval system
- Configuring the system for use in your library
- Personalizing your product with your own preference settings

After you become familiar with the basic functions of the product, you can use the rest of this handbook as a reference for less common tasks, for maintaining your system, and also as a source of information if you have problems operating the system.

This End User's Guide is designed for all CIT (Certified Integrators by INVENGO) and for INVENGO Expert Network customers implementing a low-cost and high-performance RFID solution.

This document does not assume any in-depth knowledge of Radio Frequency Identification (RFID) technology, but personnel in charge of pedestal installation need to follow a minimum training or have previous experience in RFID equipment installation.

conventions

Symbol	Meaning
	**CAUTION: A note that advises users that a specific action could result in loss of data or damage the hardware.** **WARNING: A note that advises users that a specific action may result in physical harm.**
	**A note that provides additional information that helps the user performing a task or obtaining the most out of the product.**

Table of Contents

1 For Your Safety

1.1 General Use

The LSP3A product range is designed to be reliable and to provide continuous, trouble-free service. Please observe the following general tips:

1. Take care not to scratch the device. Keep the device clean. When working with the device, use only INVENGO-approved accessories.
2. This device is not waterproof and should not be exposed to rain or moisture. Under extreme conditions, water may enter the circuitry.
3. Protect the device from extreme temperatures. For example, do not place the device in a windowed area where the sun may cause extreme temperatures, and keep it away from heaters and other heat sources.
4. Do not store or use the device in any location that is extremely dusty, damp, or wet.
5. Use a soft, damp cloth to clean the device. If the surface of the device becomes soiled, clean it with a soft cloth moistened with a diluted window-cleaning solution.

1.2 Care and Maintenance

This device should be handled with care. The suggestions below will increase the lifetime of this device.

1. Keep the device dry. Precipitation, humidity and liquids contain minerals that will corrode electronic circuits and tarnish transparent plastic parts.
2. Do not use or store the device in dusty, dirty areas. Its moving parts can be damaged.
3. Regularly dust the large transparent part using a soft cloth and antistatic liquid.
4. Do not store in hot areas. High temperatures can shorten the life of electronic devices, damage batteries and warp or melt certain plastics.
5. Do not store in cold areas. When the device warms up (to its normal temperature), moisture can form inside the device, which may damage electronic circuit boards.
6. Do not attempt to open the device. Non-professional handling of the device may damage it and will void the INVENGO warranty.
7. Handle the device with care. Shock and vibration may break internal circuit boards.
8. Do not paint the device. Paint may clog the device's moving parts and prevent proper operation. Paint with metallic contents may limit device performances.
9. If the device or any accessory are not working properly, take it to your nearest qualified INVENGO representative.

	**Do not clean the device, particularly the transparent plastic parts, with harsh chemicals, cleaning solvents or strong detergents. Gently wipe the device with a soft cloth slightly dampened in a mild soap-and-water solution. Eliminate any residual moisture with another clean and wet soft cloth.** **Also regularly apply specific antistatic products for Acrylic Surfaces.**

1.3 Important Safety Information

When connecting the device or any accessory to another device, read its user's guide for detailed safety instructions. Do not connect incompatible products.

As with all RF equipment, users are advised that the equipment should only be used in its normal operating mode described in this document.

2 Certification

2.1 Occupational Health and Safety Notices

INVENGO Products have been designed not to exceed the limits given in the European Standard EN 50364 "Limitation of human exposure to electromagnetic fields from devices used in Electronic Article Surveillance (EAS), Radio Frequency Identification (RFID) and similar applications" in conjunction with the European Standard EN 50357 describing how to evaluate the exposure level.

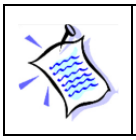
2.1.1 Public Exposure

The Library RFID pedestals are designed assuming that patrons cross the detection area within a couple of seconds on their way in and out of the Library at a normal walking pace. General public should not stand in the detection area for more than 10 to 20 seconds.

2.1.2 Employees Exposure

The operators are located apart from the principal detection zone and as a matter of fact, not subject to exposure.

(Please see section 4.3.2 "Placement of Pedestals")

	**Librarian should make sure that nobody stands still in the Gate Detection Area in between two RFID Pedestals to avoid unnecessary prolonged Exposure to Electromagnetic Field.**

2.2 Safety Notices

The LSP3A has been tested to be in conformity with the EN standard 60950-1: "Information Technology Equipment Safety"

	**For servicing operations it is recommended to deactivate the RFID system.**

It is the responsibility of the CIT (Certified Integrators by INVENGO) to install the LSP3A as described in INVENGO Product Manuals or INVENGO Documentation.

Modification of any INVENGO Library System is prohibited without the written consent of INVENGO.Unauthorized modifications may void the conformity of the equipment to safety specifications and will void the INVENGO warranty.

2.3 Regulatory Notices

An RFID system typically composed of an RF emission device such as the XC-RF300 is subject to national regulations that may differ by country.

One important item to consider is the maximum permissible magnetic field intensity at a distance of 10 meters from the antenna that must not exceed 60dBμA/m in Europe and 38dBμA/m in US.The LSP3A meets these limits.

2.3.1 In Europe (CE and RED Directives)

The LSP3A complies (CE Declaration of Conformity granted) with the European EMC directive.

It is the responsibility of the INVENGO Reseller to install the LSP3A as described in this Reference guide or INVENGO Documentation.

Any modification of the LSP3A is prohibited without the written consent of INVENGO. Unauthorized modifications may void the conformity of the equipment to CE and RED Directives and will void the INVENGO warranty.

	**It is the responsibility of the CIT (Certified Integrators by INVENGO) to install the LSP3A as described in this Reference Guide or in INVENGO Documentation.** **If an LSP3A is further integrated in a different product, it is the responsibility of the manufacturer of this complementary product to obtain the required approvals for this product.**

2.3.2 In USA (FCC Directive)

The LSP3A has been designed to comply with Part 15 of the FCC Rules. Furthermore typical configurations listed section 2.2.2 FCC ID Cross Reference Table have been successfully tested with Part 15 of the FCC rules.

WARNING TO USERS IN THE UNITED STATES
FEDERAL COMMUNCIATIONS COMMISSION (FCC) RADIO
INTERFERENCE STATEMENT 47 CFR Section 15.105(b)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different to that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NO UNAUTHORIZED MODIFICATIONS

47 CFR Section 15.21

CAUTION: This equipment may not be modified, altered, or changed in any way without signed written permission from INVENGO. Unauthorized modification may void the equipment authorization from the FCC and will void the INVENGO warranty.

ANTENNA REQUIREMENT

47 CFR Section 15.203

CAUTION: This equipment must be professionally installed. The installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded. Nonprofessional installation or installation of the equipment with an improper antenna may void the equipment authorization from the FCC and will void the INVENGO warranty.

2.4 RoHS and WEEE Directives

2.4.1 RoHS

INVENGO certifies that this product is compliant with the European 2011/65/EU & EU 2015/863 for the restriction in Electric and Electronic Equipments (RoHS) of the use of the following hazardous substances:

a) Lead

b) Mercury

c) Cadmium

d) Hexavalent Chromium

e) Polybrominated biphenyl flame retardants

f) Polybrominated diphenyl ether flame retardants

This declaration is based on information provided by our suppliers and subcontractors.

2.4.2 WEEE

This product bears the selective sorting symbol for waste electrical and electronic equipment (WEEE)

This means that this product must be handled pursuant to European Directive 2011/65/EU & EU 2015/863 in order to be recycled or dismantled to minimize its impact on the environment.

For further information, please contact your local or regional authorities.

3 System Overview

3.1 Key Features

As a standalone solution, INVENGO security pedestals do not need to be linked to the library database and can still operate when the Integrated Library System (ILS) is down or under maintenance. The security pedestal does not require additional equipment to operate. The LSP3A pedestal features:

- Multi-protocol features which makes it compatible with ISO15693 chips
- NXP proprietary EAS mode supported for the C370 (NXP SLI), C370-L (NXP SLI-L) chips
- AFI mode supported, with configurable AFI value (Multiple AFI values, up to 4)
- Multiple items Read-Memory supported in EAS mode for C370 (NXP SLI), C370-L (NXP SLI-L)
- Standard Multiple items Read-Memory supported in AFI mode using the optional command Read Multiple Blocks as described by the ISO15693-3
- Enhanced Multiple items Read-Memory supported in AFI mode for C370 (NXP SLI), C370-L (NXP SLI-L), Tag-it ™HFI (Texas Instruments) chips, LRI-2K (STM).
- Read-Memory Data Model: up to 896-bits (28 blocks of 32bits)
- One electronic system block embedded into bottom of Pedestal
- A remotely accessible people counter based on dual photoelectric sensors coupled to a reflector, allowing in and out traffic monitoring.
- Ethernet Networking Link communication for set up, database and patron counter value retrieval
- Asynchronous Event Notification over the Network: pedestal sends automatically data upon Book Detection, Patron Counter change, GPIO level change or Pedestal fault detection.
- Trigger input to quickly power up and down remotely the pedestals using light cells before and after the pedestal area. This lowers down the radio emission levels to the strict minimum necessary.
- One Extra Open Drain Output to drive External Alarm Device: Webcam, Extra Remote Display or Sound

It is a cost effective security system as it only requires a single RFID tag for both anti-theft and identification purposes.

In addition to these standard features, the LSP3A Clear can be personalized upon demand with the library identity printed on plastic covers. The electronic stays the same and performance are unaltered compared to the LSP3A Clear standard model.

3.2 LSP3A Clear Brief Description

Figure 3.1: LSP3A pedestal

All components of the LSP3A system are contained within the LSP3A. At least two pedestals are required for each EAS gate or passageway. A set of pedestals is known as a gate and may consist of several pedestals. Please see section 4 "Installation" for more information. The LSP3A models are built in a one frame:

- An LSP3A Electronics unit is used to control each pedestal. This electronics unit generates the RF signal transmitted by the antennas and picks up the reply from the RFID tag. If an activated RFID tag is detected, the electronics unit will activate the LED/buzzer alarm
- These antennas are sensitive receivers used to detect the theft bit status and the AFI value of the RFID tag as it passes through the EAS gate
- Visual and audible warning devices
- A remotely accessible people counter equipped with dual light barrier photoelectric sensors.

To operate, the LSP3A Clear Model will only need an IEC power supply cable, avoiding unnecessary mains cable wiring up.

An IEC Mains Supply Cord Outlet is available to allow daisy chaining. A series of up to 5 pedestals can be powered up from a single wall socket.

4 Installation

4.1 Recommendations before Installation

This section describes how to install the LSP3A Clear.

4.1.1 Wire Feed Sheaths

Within the framework installation you need at least a power supply cable sheath and an Ethernet cable sheath to connect to the Ethernet network. These sheathed cables will be located at the bottom center of the pedestal as shown in Figure 4.10.

If needed according to the installation configuration, extra sheathed cables need to be placed for wire synchronization, Trigger cable and to remotely switch the RF on & off and I/O cables to drive external devices (Camera, Remote alarms…).

The LSP3A is delivered without any IEC terminated plug power supply cable or Telecommunication cable. It is up to the Local installation personnel to use the appropriate IEC Power Cord according to local electrical regulations.

	**Use appropriate IEC power cord according to the local regulations to power upand interconnect the pedestals.**

	**The Power Supply Cord is the LSP3A Product Main Disconnecting Device, It should be easily accessible at any time to Disconnect the pedestals from the mains power supply.**

4.1.2 Electrical Safety Rules

The LSP3A Clear is powered up via a Mains Supply IEC Cord.

A group of up to 5 Pedestals can be daisy chained and powered via a single IEC power cord connected to a wall socket. The mains wall socket should provide at least 2 Ampere and be protected by a differential circuit breaker limiting the current to 5 Ampere maximum.

Figure 4.1 here below shows how to connect the LSP3A pedestals to the mains.

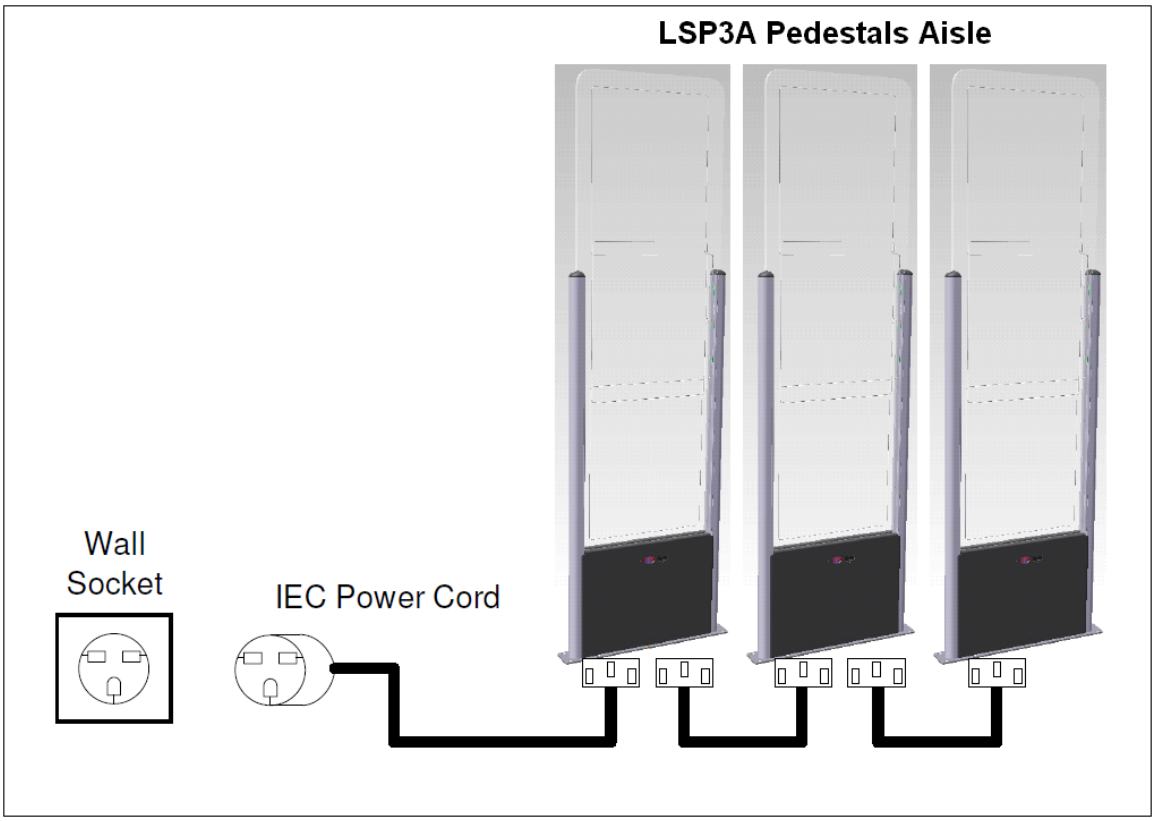


Figure 4.1: Safety Electrical Installation Using Power Cord

	**The electrical installation must be carried on by qualified personnel only. For each country where installation takes place, an adequate IEC power supply Cord must be used, fitting the local wall socket layout.**

4.1.3 Network cable installation

The LSP3A delivery package does not include an Ethernet cable to connect to a Local Area Network for remote operation. We recommend the use of a Shielded Ethernet cable, UTP-Cat 5.

4.2 LSP3A RFID System Components

The components included in the LSP3A RFID System package are listed in Table 4.1

Tble 4.1: LSP3A System Components

Quantity	Description
1	LSP3A Pedestal
1	2 ways 3.81mm Green Screw Tightening Plugs Vertical Cable Entry for Synchronization Cable

4.3 LSP3A Clear

	**This equipment is intended for indoor use only under the conditions described in this document. Should it be used outside these conditions cannot be guaranteed, and is not recommended. Please read section 1 "Publishing Information" before installation or use.**

4.3.1 Tools Required

The following tools are required during installation:

- Measuring Tape
- Square
- Hand Drilling Machine with 4 mm, 8-mm and 19-mm drilling bits
- Philips-head screwdriver
- Spirit Level

4.3.2 Placement of Pedestals

Pedestals must be mounted between 800mm and 980 mm apart (edge to edge) for maximum reliable performance. There should be at least one pair of pedestals at each entrance/exit point of the library. There should be a pedestal at each edge of the entrance, and a Clear space of at least 500 mm around the edge of the pedestals to ensure that the antennas will not be detuned. This Clear space must not contain any metallic objects, but may contain some substrates such as non-metallic/non-conductive building materials such as wood, glass, chipboards and plasterboards.

	**Each LSP3A should be installed within following tolerances:** **Horizontal angular alignment tolerance with reference to pedestals alignment:0° +/-2°** **Vertical angular tolerance with reference to ground surface : 90° +/-1°**

	**Each LSP3A must be installed at least 2 meters away from sliding doors. Metal frames do pick up & radiate stray Radio ham electromagnetic field which can lead to false triggering. Prior to installation a site survey is highly recommended.**

Be cautious to properly align the pedestal in order to center the photoelectric beam sensor on the reflector of the next pedestal.

CAUTION	**In case several Pedestal rows (group of Pedestals) to be installed it is mandatory every LSP3A being positioned in the same direction (all people counter of each looking toward the same direction). This would prepare the installation for future implementation of direction sensing.**

A: Indicates the distance (6 ft. 6in.) to a permanent librarian position.
B: Indicates the distance (8 ft.) from other RFID stations.
C: Indicates the recommended distance (36 in. face panel to face panel) between pedestals.
D: Indicates the minimum distance (31½ in.) between a pedestal and large metal object.
E: Indicates the minimum distance (20 in.) between a pedestal and small metal object.
F: Indicates the minimum distance (30 ft.) between Master pedestals (specific synchronization ID, see section 5.2 "Understanding the LSP3A Synchronization Process").

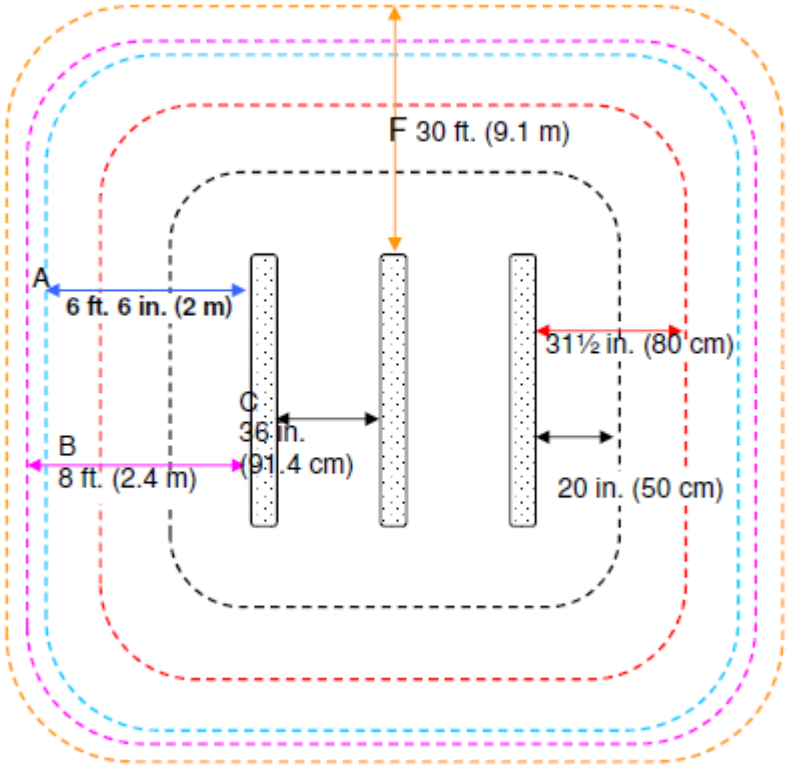


Figure 4.2: Clearance Distances around Pedestals

4.3.3 Installing the Pedestal

Once the LSP3A will be powered, the photoelectric sensors will emit a red light beam. To precisely align the sensors and the reflector, an orange LED is present on the back of the photoelectric sensor. When the orange LED is continuously on, the sensor and the reflector are perfectly aligned.

To see these LED, one must first unscrew the Plastic Bottom Cover covering the dual cells (see picture of 5.6.1 Resetting the Counter Display).

On the contrary when the orange LED is blinking or off, then you have to adjust the photoelectric sensor, so that the red light beam is centered with the opposite reflector. This operation is achieved using a white paper to Clearly see where the red light beam is pointed at. When perfectly centered, the orange LED will continuously be ON.

On Figure 4.6 below, the two Beam Crossing Cells support is shown. To do a fine adjustment of 2 beams, use a hexagonal key to screw or unscrew the top left screw (to adjust height of beams)

and the bottom right screw (to adjust the lateral positioning of the beams). They are spring loaded to improve accuracy and keep in place the two sensors after adjustment.

Special attention must be taken for the 2 pedestals positioning:

- They must be positioned facing each other's
- They must be parallel
- They must be well aligned and well centered.
- The orange LED must be continuously ON when powered (See Figure 4.3)
- If the orange LED still blinks when perfectly aligned and centered, check that the spacing does not exceeds the recommended values.
- For correct In & Out counter operation, the pedestals must be placed according to the library flow of patrons. See Figure 4.5 and Figure 4.6 for In & Out counting direction.

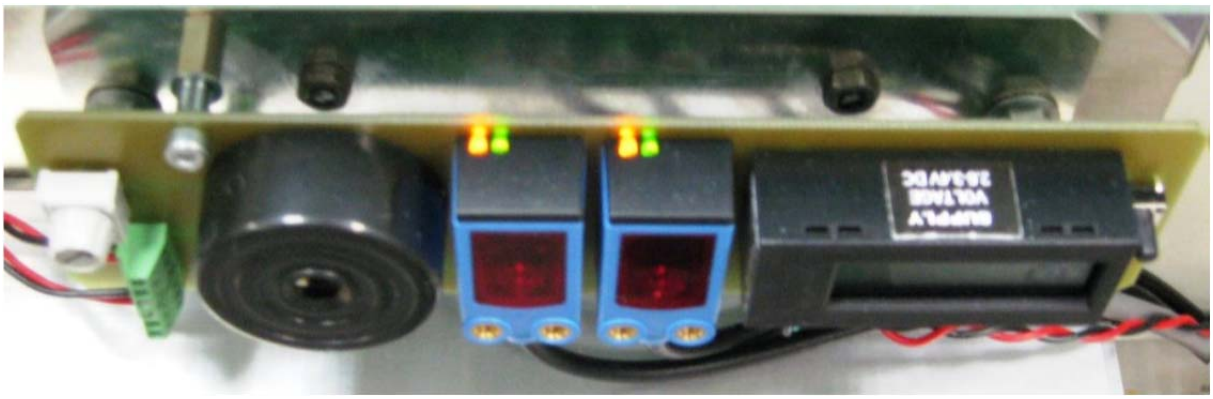


Figure 4.3: Light Barrier Orange and Green LED Lit when positioning correct (previous model)

CAUTION	**Before final Installation, do make sure that the Entrance flow is in line with the in Counter Increment Direction Described in Figure 4.5 and Figure 4.6. There is no mean to change the In & Out Counter Direction by software afterward.**

Then the 2 pedestals can be secured to the ground.

A good positioning will ensure the two red LED beams to be back scattered by the reflector as shown below. See Figure 4.3 for LED positioning.

Figure 4.4: Light Barrier Latest assembly with 4 LED 7-segment Displays (latest model)

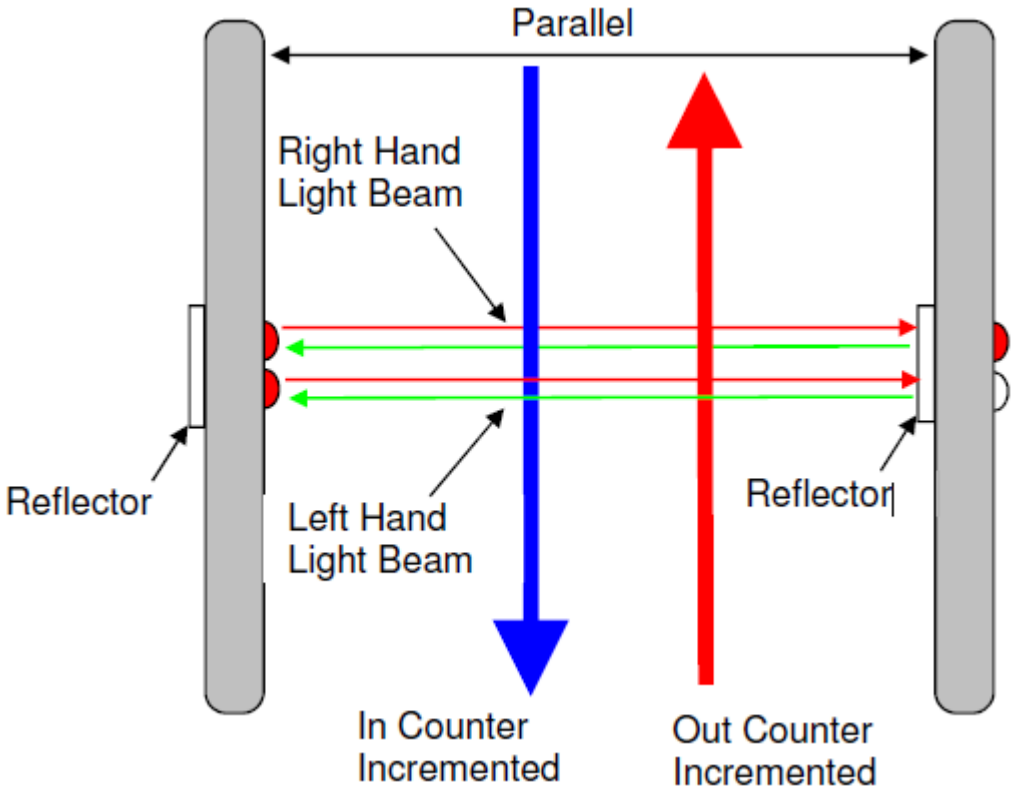


Figure 4.5: Top view of correct LSP3A installation and In/Out Counter Directions

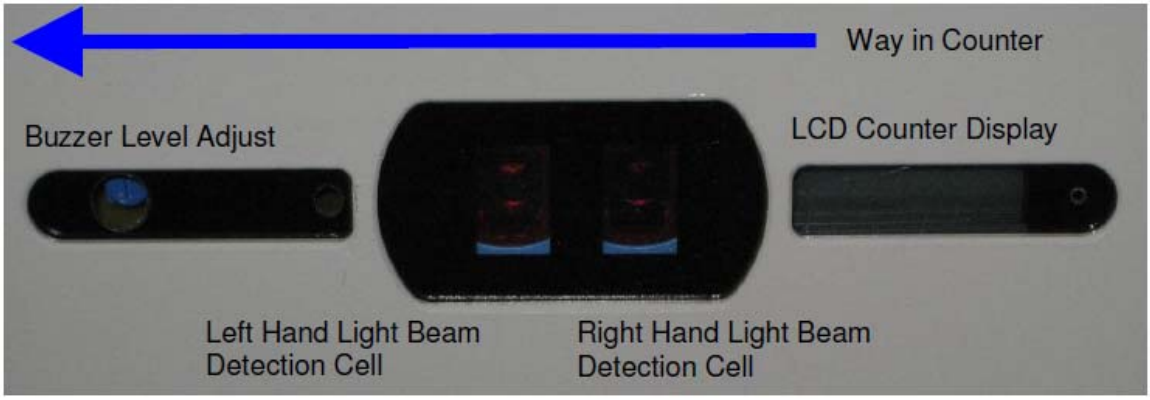


Figure 4.6: People Counter View when facing light barrier and counter display

CAUTION	**Latest People Counters are based on 4-Digit LED Display, Larger and brighter than previous LCD to ease readout. See Figure 4.7: Latest Light beam Crossing Detection Cells & 4 Digits LED Display detailed description and Figure 4.4: Light Barrier Latest assembly with 4 LED 7-segment Displays photograph.**

	On LED Displays the maximum Capacity is still of 8 Digits, but the display continuously scrolls above 9999 counts. A decimal point marks the thousands: 11'268 will display the sequence: { 1} {11.} {11.2} {11.26} {1.268} {.268 } {68 } {8 } { }

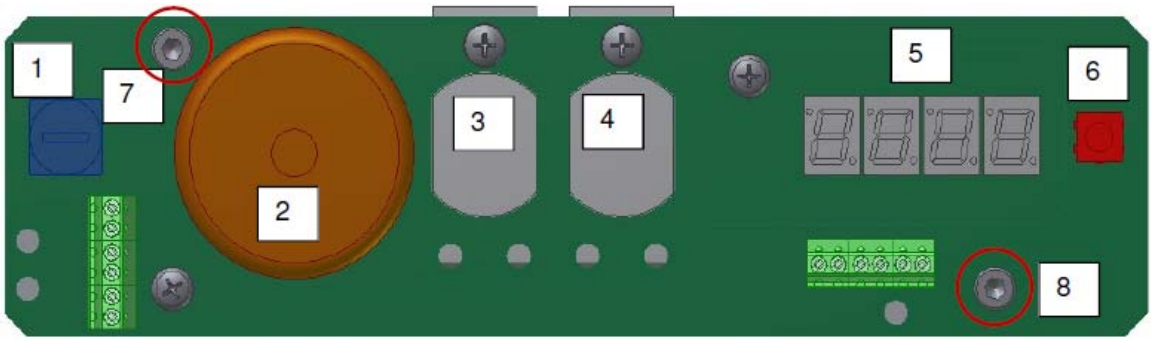


Figure 4.7: Latest Light beam Crossing Detection Cells & 4 Digits LED Display

Table 4.2: Description of Buzzer & Counter board Components

Reference n°	Designation Function
1	Buzzer Volume Adjustment
2	Buzzer
3	Photoelectric Reflex Switch Red Beam
4	Photoelectric Reflex Switch Red Beam
5	LCD or LED Display & Counter
6	Counter Reset Push Button
7	Hexagonal Screw for Light Beam Vertical Alignment
8	Hexagonal Screw for Light Beam Horizontal Alignment

On Figure 4.8 below, the two Beam Crossing Cells support is shown. To do a fine adjustment of the 2 beams, use a hexagonal key to screw or unscrew the top left screw (to adjust height of beams ref 7 circled) and the bottom right screw (to adjust the lateral positioning of the beams ref 8 circled).

They are spring loaded to improve accuracy and keep in place the two sensors after adjustment.

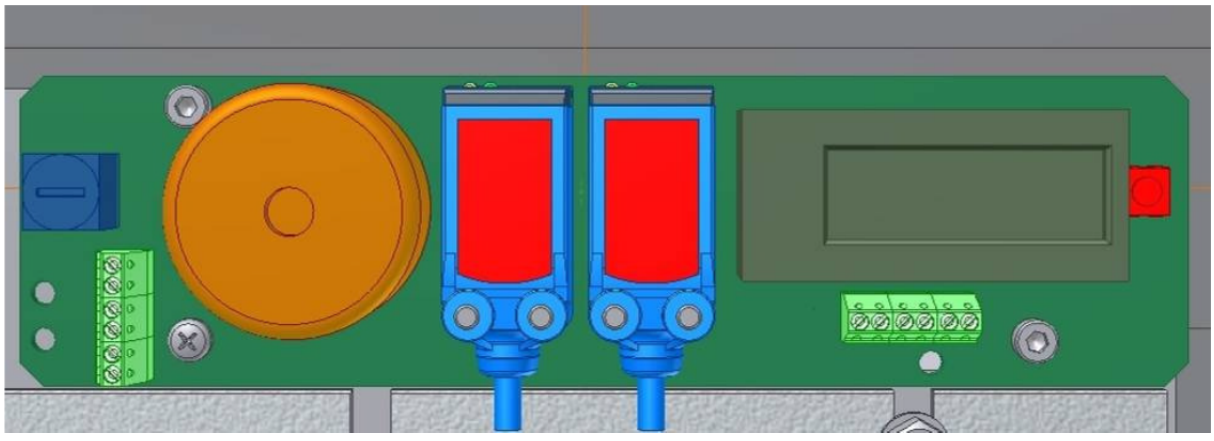


Figure 4.8: Previous Light Beam Crossing Detection Cells & 8 Digit LCD Display

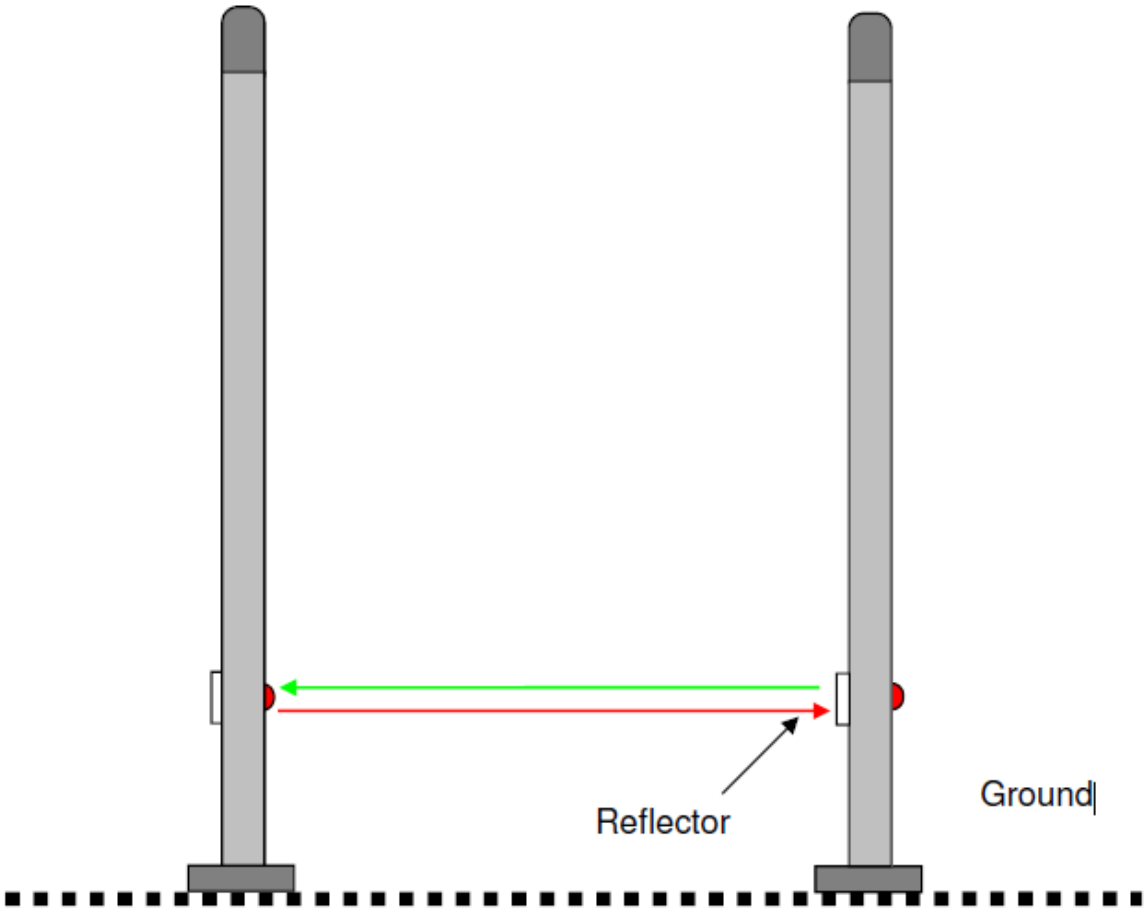


Figure 4.9: Side view of correct LSP3A installation

After having defined the location of the pedestals, refer to the mechanical drawing of the pedestalmounting diagram for the LSP3A Clear (Figure 4.10). The pedestal is fastened to the floor using screws that are strong enough to support the weight of an average adult falling against The pedestal.

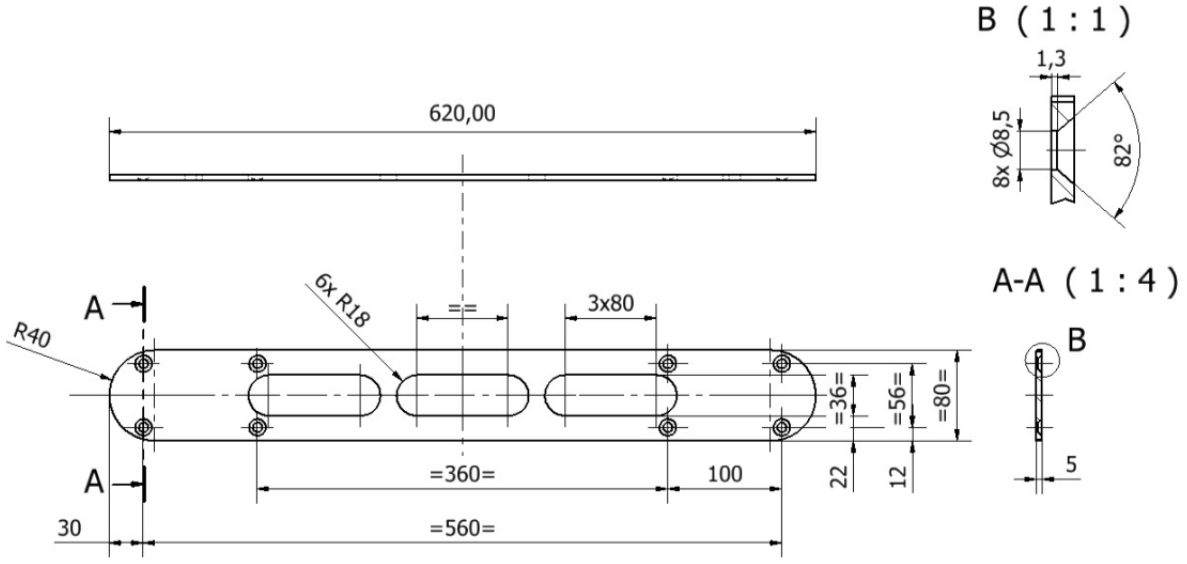


Figure 4.10: LSP3A Clear Mounting Plate Outline

1. Identify and mark the location of the holes to be drilled for mounting the pedestal to the ground. The use of a tape measure and a square is recommended.
2. Drill the cable access and mounting holes according to the type of ground surface:
   a. Wooden floor: Drill eight holes with a diameter of 4 mm for the mounting screws and one hole with a diameter of 19 mm for the cable access.
   b. Cement floor: Drill eight holes with a diameter of 8 mm for the cement floor plugs and one hole with a diameter of 19 mm for the cable access. It may be necessary to provide a groove for the power supply cable connected to the LSP3A Electronics Unit. Insert the concrete floor plugs into the mounting holes.

CAUTION	**Always use a protective sleeve for main power cable, which match to the flammability grade of the product. Mains power cable must be a 3 wire (line,neutral and earth), multi stranded copper wire, minimum section of 0.75 mm²/3A)**

Figure 4.11: LSP3A Clear Bottom Plastic Cover (4 screws)

3. Remove the pedestal from the box.
4. Remove the plastic cover from the both sides after removing the 4 fixing screws.
5. Engage the power supply cable in the electric sheath and the Ethernet cable in the other sheath (please refer to section 4.1.1 "Wire Feed Sheaths").
6. Place the pedestal base over the mounting holes. Insert and fasten the screws in the mounting holes according to the type of ground surface:
   Wooden floor: Insert the screws directly into the mounting holes and tighten the screws in place.
   Concrete floor: Insert the screws into the concrete floor plugs and tighten the screws in place.

	**When tightening the screws in place, first tighten the screws in place ¾ of the way. Once all screws are in place, then tighten each screw progressively, one after each other to ensure that the floor bracket is solidly fixed into place and completely vertically aligned. The use of a level may be required.**

7. Plug in the mains IEC power cord from the previous pedestal if daisy chained or from the wall mounted socket. See figure in Chapter Electrical Safety Rules

	**No Live AC mains 110/230V during installation!** **Make sure there is no power supply current before carrying on the connectionoperations.** **To do so, unplug the IEC Power Cord from the wall socket.**

8. Once all the LSP3A pedestal have been installed, close the micro circuit-breaker (Figure 4.1) to power up the system before starting configuration operations. Please see section 5 "Configuration".

9. After the configuration has been carried on, replace the two plastic covers and tighten the 4 fixing screws.

4.4 LSP3A Clear Replacement or Extension of an existing Installatio

As all LSP3A Clear have the same mounting plate and people counters location, you can reuse the existing holes drilled into the floor to affix the replacement pedestal and the IEC power cord.

Just make sure that you have the right Radio firmware installed in your new pedestal before starting the system as the aisle synchronization and configuration could be impaired though no irreversible damages would occur.

5 Configuration

All configuration operations of LSP3A systems are carried on with the LSP3A Web UI.

5.1 Chip Configuration

For optimal performance the scanning duration (T_scan) should not exceed 250ms. T_scan is the period to scan all pedestals of a group of N pedestals, i.e. a Master and (N-1) Slave Pedestals. Depending on your chip configuration and the number of pedestals installed you can determine the scanning duration of your installation.

5.1.1 Scanning duration per pedestal

Table 5.1: Scanning Durations No Tag in field

	Duration per pedestal in ETSI mode (ms)	Duration per pedestal in FCC mode (ms)
Synchronization process	10	10
C370/-L, Tag-It, ISO15693 EAS or one AFI, detection only	20	100

The scanning duration per pedestal will vary according to the configuration you selected. The scanning duration will always include the synchronization process of 10ms.

Example 1: with a system using the 370-AFI in ETSI mode.

The scanning duration per pedestal will be: T_single _scan = (10ms+20ms) = 30ms

Example 2: with a system using the 370-AFI1-AFI2 in ETSI mode.

The scanning duration per pedestal will be: T_single _scan = (10ms+20ms+20ms) = 50ms

Example 3: with a system using the 370-EAS in ETSI mode.

The scanning duration per pedestal will be: T_single _scan = (10ms+20ms+15ms) = 45ms

5.1.2 Global scanning duration

The global scanning duration (T_scan) will depend on the synchronization mode you have selected. Hardwired synchronization is faster than wireless synchronization.

Table 5.2: Global scanning duration versus Synchronisation mode

Synchronization Mode	T_scan
Hardwired	= T_single_scan x Nb_Pedestals

Example 4: with a 4 pedestals system using 370-AFI1-AFI2 in ETSI mode.

The global scanning duration will be: T_scan = 50ms x 4 = 200ms if used hardwired.

The global scanning duration will be: T_scan = 50ms x ((2 x 4) – 2) = 300ms if used wireless.

5.1.3 EAS Mode versus AFI Mode

EAS mode is only supported by the C370 or C370-L (NXP chip). AFI mode is supported by most ISO15693 chips, from major chip manufacturers (NXP, Texas Instrument, STM, Infineon, MeMarin…).

EAS digital burst is a prime number data stream of 128 bits which is read out after sending a check EAS command to the Tag. This dedicated EAS command in only implemented in NXP SLI chips.

The AFI (Application Family Identifier) is an 8bit-field defined in the ISO15693 standard but not mandatory. Whenever issuing an inventory command with a specific AFI code, only Labels with the same matching AFI code will reply with its UID. Generally the code 9E is used to say that the book has not been properly checked out, thus will be detected by the pedestals.

5.2 Understanding the LSP3A Synchronization Process

5.2.1 Standard Synchronization Mode

To manage a group of pedestals, a synchronization burst is sent by the master pedestal to all the slaves' pedestals, a token being propagated back and forth as in a token ring process. This is called the synchronization process.

- Only one pedestal is defined to be the master who emits a synchronization burst to the next slave in close proximity who in turns emits it to the next slave and so forth.
- The other pedestals, configured as slaves, get the synchronization from the neighboring pedestal and emits back to the next Slave of higher index.

	**Default Configuration of the LSP3A is set to Master 2 Pedestals.**

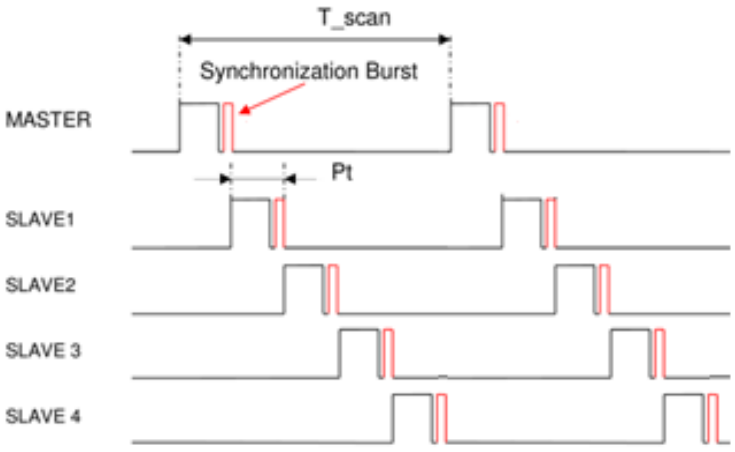


Figure 5.1: Chronogram Sample (1 Master/ 4 Slaves)

- Synchronization burst: start burst to synchronize the gates (Period of T Scan ms)
- Processing time (Pt): depends on the number of tags to be detected and the settings. The fastest is when only detection is used (EAS burst or AFI), the slowest when all features are used (AFI + Read AFI + Read 16 blocks of memory). Refer to the figures in Table 3:Scanning Duration.

Synchronization process for 3 pedestals:

1- The master scans the configured chip, then sends the synchronization burst to Slave1
2- Slave1 scans the configured chip, then sends the synchronization burst to Slave2
3- Slave2 scans the configured chip, and then sends the synchronization burst back to either the master when in hardwire mode.

This process is repeated indefinitely.

In case the master does not receive back the synchronization burst from the last slave after a defined period, it will automatically restart the synchronization process.

The number of pedestals is not limited to any particular number as long as each gate is close enough to its neighboring pedestal and that the overall scanning time does not exceed a few 100ms to allow for a safe detection at 1m/s pace trough any gate.

5.2.2 Synchronization by a pair of Wires

This mode is mandatory in noisy environments or when nearby RFID devices are placed too near within a couple of meters from any pedestals preventing the installation using wireless settings.

It is also mandatory when using too many pedestals (typically above 4 to 6 pedestals) as wireless burst signal needs to go to the last slave N pedestal and then back going through all N slaves before the master can scan its detection volume again. Processing time is thus equal to 2N times Pt in wireless mode.

Using a synchronization cable, the token can be directly handed over by the last slave N to the Master without having to go through all N Slaves pedestals again. Overall scanning time is thus equal to N times Pt.

In this case the LSP3A synchronization by wire. Refer Figure 5.13 to see the correct fields to be modified. There will always be one & only one LSP3A Master and all others pedestals set as Slaves. Each pedestal is connected to the
other using ideally a twisted pair cable. This cable will propagate the synchronization signal to all pedestals in a daisy chain.

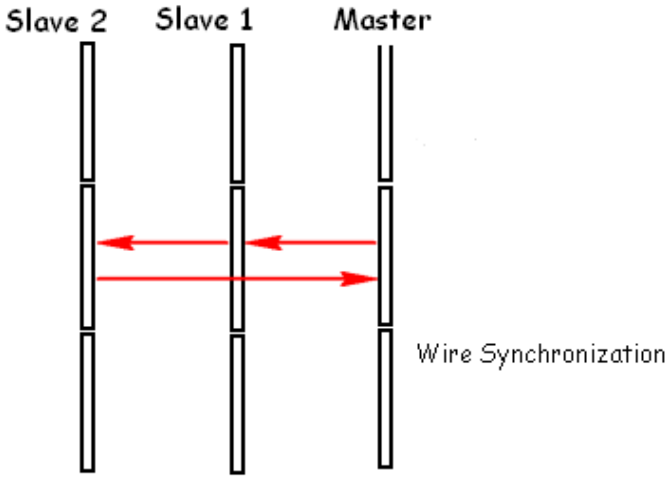


Figure 5.2: 3 Pedestals Configuration Example and Token Propagation

Wire Synchronization Token hand over

Wire connection:

First prepare a cable of appropriate length to connect 2 consecutive Electronics as shown in Figure 5.3 and Figure 5.4

A minimum wire gauge of 22AWG (0.2mm²) is enough, preferably a twisted pair. Screw at each extremity of the cable a 2-way connector with ground wire at the same position for each module. If more than 2 pedestals are used to form the aisle, then connect the wires in parallel to go to the next pedestal until you reach the last one.

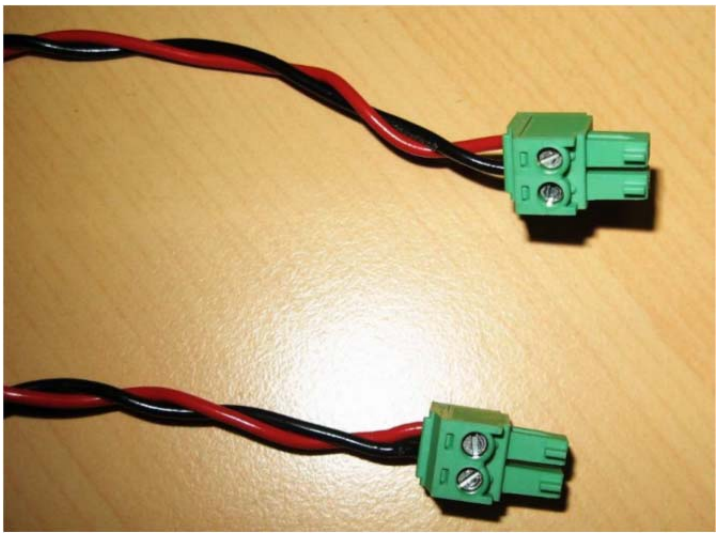


Figure 5.3: Detailed Wire Synchronization Assembly

Then unscrew the 4 screws to open the bottom plastic cover panel of each pedestal forming the aisle to gain access to the Product Electronic Module and connect the top 2-way connector as shown in Figure 5.4 thereafter.

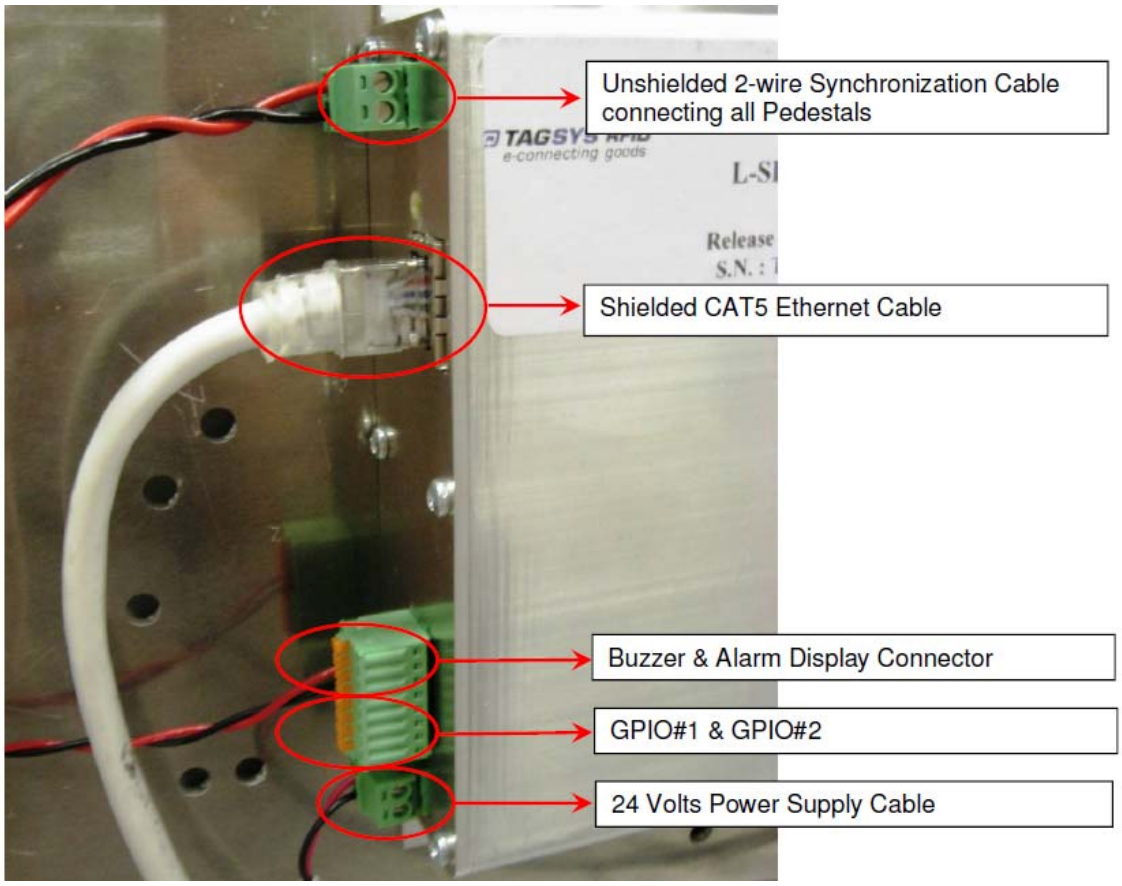


Figure 5.4: LSP3A Clear PEM Connectors & Cables Location

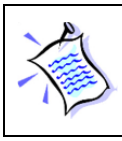
Steps to undergo:

1. Prepare a 2 wire cable of appropriate length and number of connectors to wire up each pedestal. Use the 3.81 mm Push-On Green Plugs Vertical Cable Entry provided.
2. Connect all pedestals Synchronization to the Synchronization I/O as shown on Figure 5.4.
3. Set each pedestal to hardwire synchronization modifying the "Mode" in the "Synch" Section of the "Advanced Configuration" tab of the LSP3A Pedestal Configuration Tool.
4. Write down the MAC address of each pedestal. Use the test button in "Monitoring" tab to locate it: the connected pedestal will ring and its display lit.
5. Power up the whole system (every pedestal must be powered up) and check that the synchronization process works properly detecting a book in each passageway.
6. Put the cover panel back into place and secure it with the 4 screws

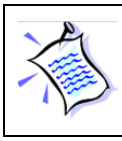
5.3 Parameters Configuration of the Ethernet Interface

	**Don't forget to power up your installation before carrying on the following steps**

The first step is to allocate a unique IP address to each LSP3A. This operation will allow identifying each LSP3A on site before configuring them on the Ethernet network.

	**By default the IP address is 192.168.9.23 (IPv4 Automatic Private IP Addressing). Ask your network administrator to obtain a static IP address for each of the pedestals connected to your local network.**

The LSP3A configuration will be carried on using a host computer connected to the local Ethernet network.

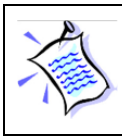
	**You can localize the each gate thanks to their IP address. Their on site location must be known to configure and set them as Slaves or Master.**

5.4 Configuration of the LSP3A Clear

"Library Pedestal Configuration Tool" is the software tool used to monitor and configure the LSP3A pedestal.

The whole LSP3A configuration is carried on from a host computer connected to the local area network. Each LSP3A is addressed thanks to its own IP.

	**In a configuration with several pedestals, as all pedestals are set as master by default, they will mutually perturb when powered on. So the first step will be to set the appropriate pedestals as slaves.**

	**Before you configure the whole LSP3A, you need to have a Clear vision of which pedestals will be masters or slaves. (Refer to section 5.2 "Understanding the LSP3A Synchronization Process")**

5.5 Running Web UI for the First Time

The web UI can be accessed via the web browser and is useful for quick setup or troubleshooting. Web browsers we support are Chrome 96.x, Firefox 95.x, and Safari 15.x.

1. Determine the reader hostname to connect to a network with DHCP server.
2. In a new browser tab, connect to the LSP3A using the URL *http://<Hostname or Static IP>*.
3. Sign into the reader using the default credentials:
   - user name: admin
   - password: admin

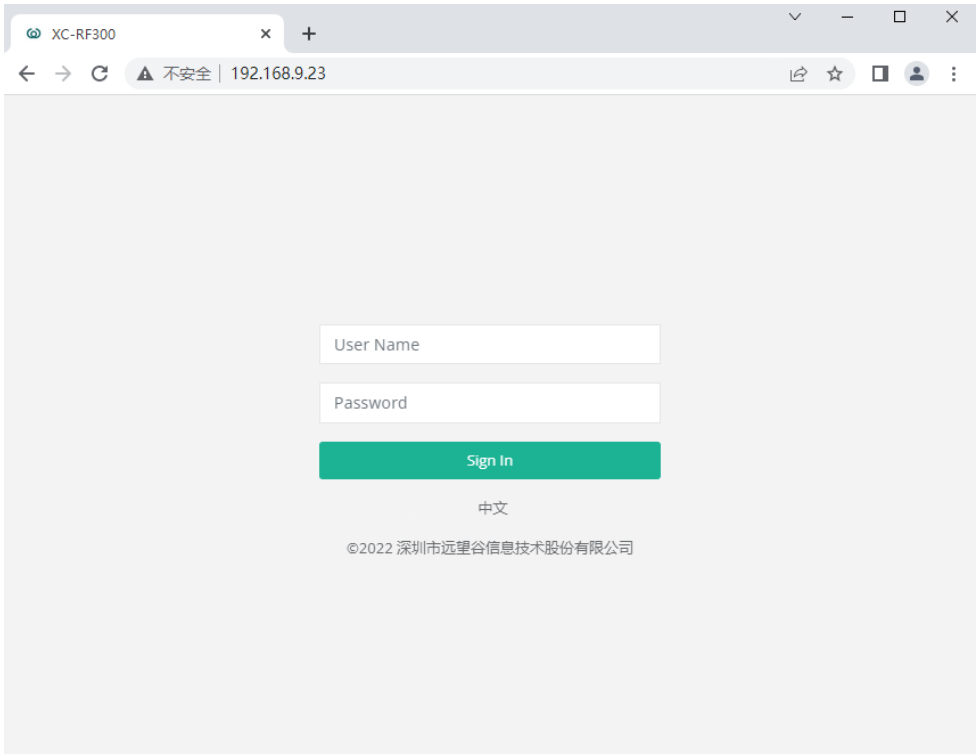


Figure 5.5: Sign In Web Page

4. The Web UI can configure ISO15693 parameters, including Uplink、Downlink(Tag to Device)、Memory Mapping(Vicc)、Application Family Identifier(AFI)、Default Read and Advanced Options.

5.5.1 Navigation

After sign in to main page, the navigation is on the top of web page, including Restore、Start/Stop Reading、Save Configuration、WaveformDisplay、Language(Choose) and Log Out buttons.

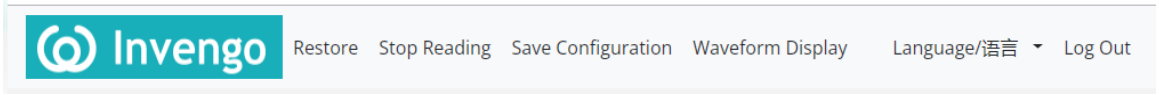


Figure 5.6: Navigation

This navigation is used either:

- Restore the device to factory setting.
- Controls whether the device is in tag reading mode.
- The configuration parameters are saved to the device and take effect.
- Go to the waveform display page and display the signal waveform.
- Log Out and return to the Sign in web page.

The device will reboot after the factory settings are restored:

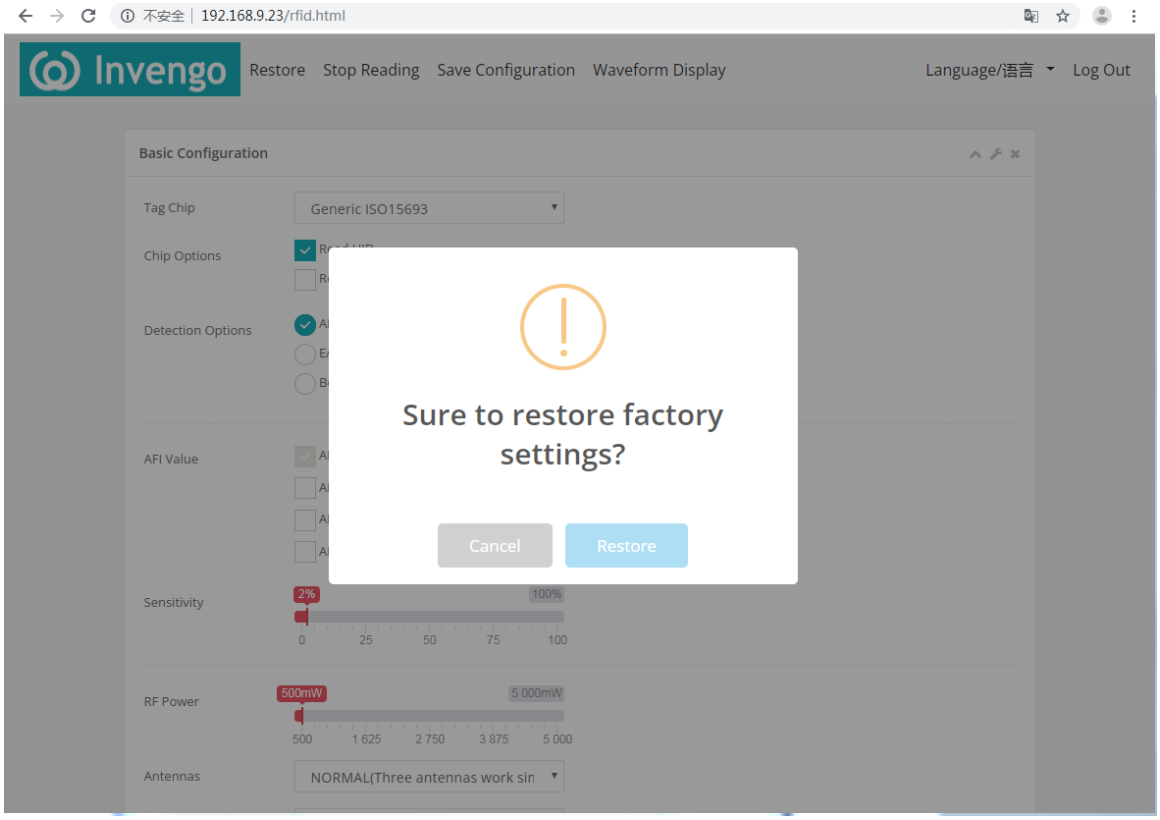


Figure 5.7: Restore the device

Click the Save Configuration button will save and take effect the configuration of modules(Basic Configuration、Gate Options and System Configuration),the saved configurations are saved even after the device is powered off.

Click the Waveform Display button will go to waveform display web page:

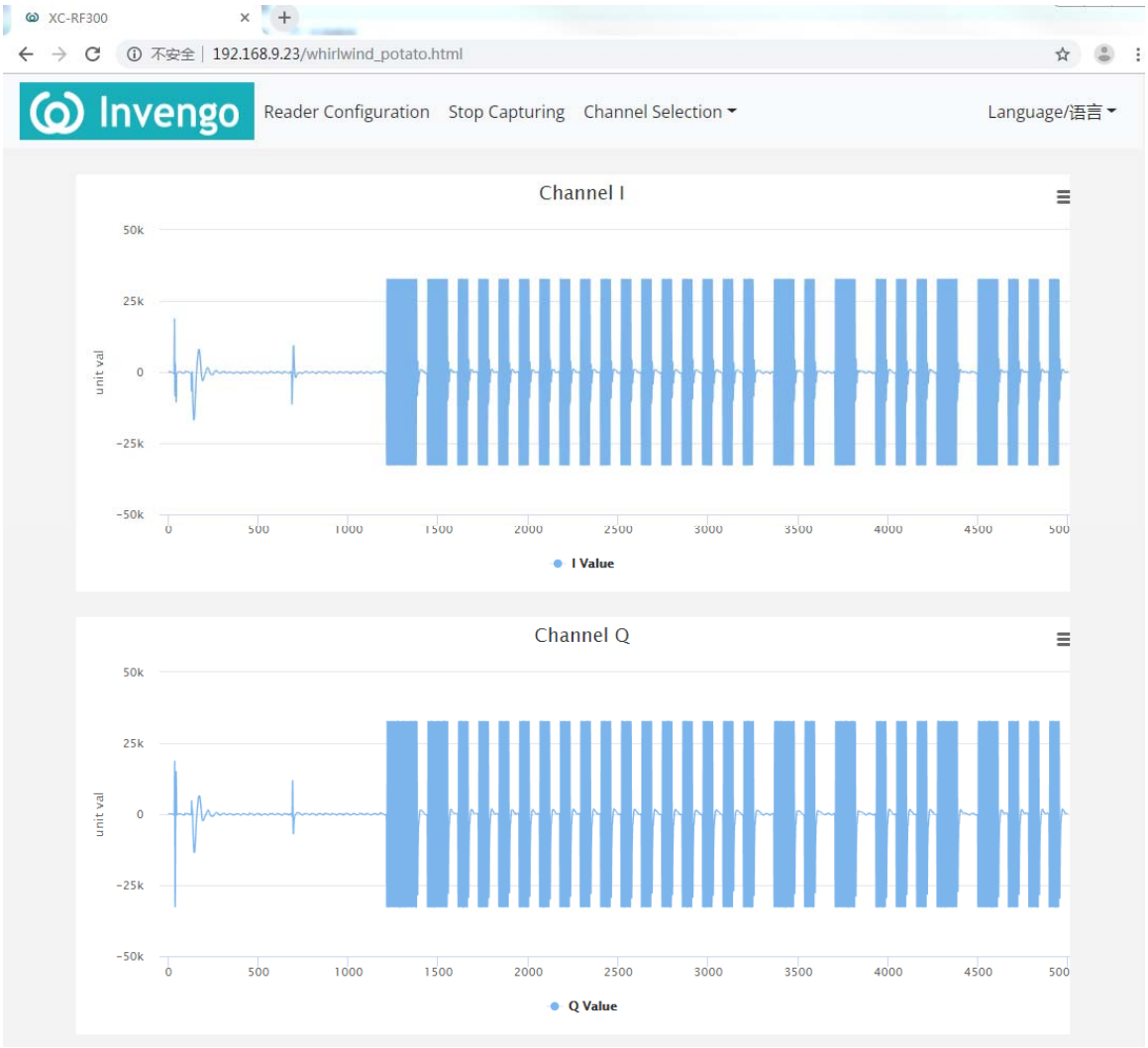


Figure 5.8 Waveform Display

The page will display the signal strength of the tag placed in the RF field. On the navigation bar of the current page, click the Reader Configuration button to return to the device configuration web page. Click the Stop/Start Capturing button to stop/start working. Click the Channel Selection button to select the display channels. When stop capturing, you can drag in the table to enlarge or download the image.

5.5.2 Basic Configuration

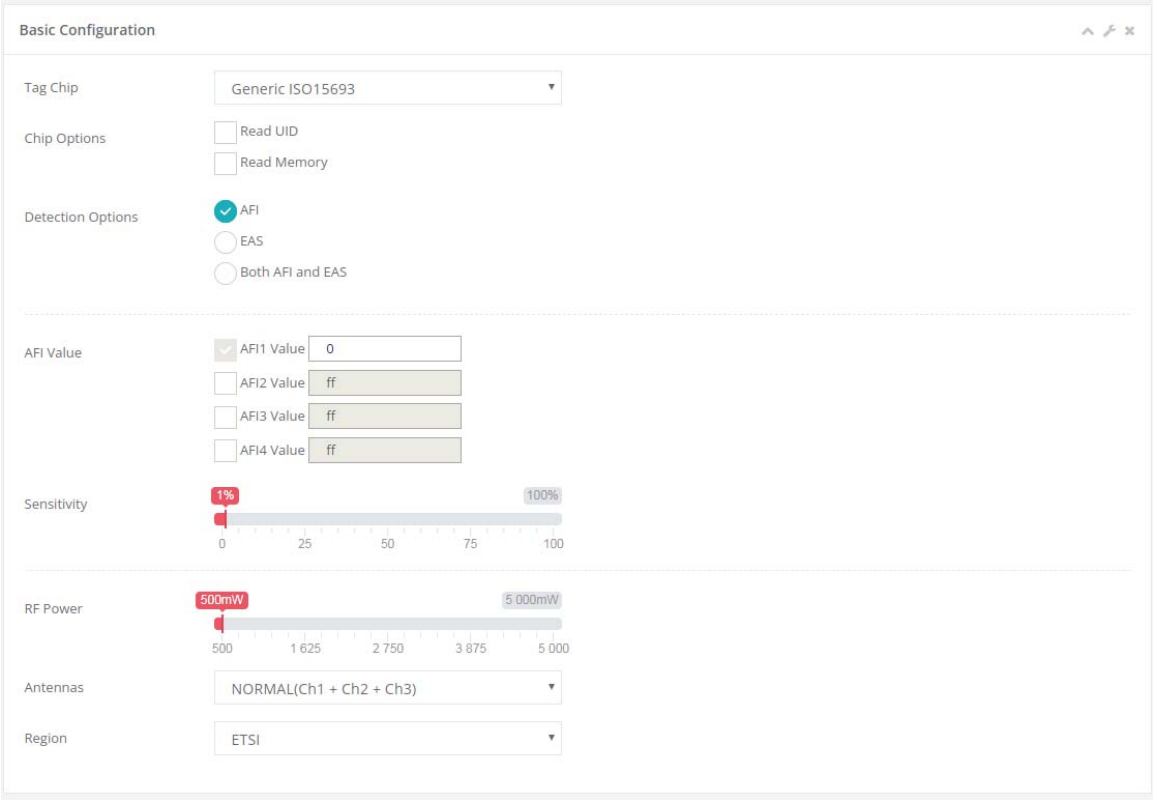


Figure 5.9: Basic Configuration

The Basic Configuration is used either:

- Select the type and content of the tag to be read.
- Select and setting the tag detection options.
- Setting antenna sensitivity.
- Setting RF Power and Working antennas.
- Setting regional standard.

Only the tag of ISO15693 protocol can be read and filtered, can choose whether to read UID and Memory.

AFI and EAS are used to filter labels and only choose one mode at a time, when select the AFI filtering mode, can select a value that triggers alarms. When the value is 0, all read tags will trigger alarms.

Drag the antenna sensitivity bar to select the antenna sensitivity. A lower value indicates a higher antenna sensitivity.

Drag the RF Power bar to select the RF Power, the minimum is 500mW and the maximum is 5000mW and each step is 500mW.

There are 6 antenna operating modes, which can be selected according to different application scenarios.

5.5.3 Gate Options

5.5.3.1 System Type and Online Mode

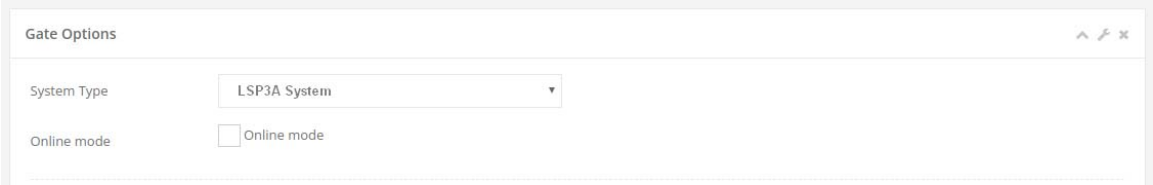


Figure 5.10: System Type

There are 2 options:

- LSP3A System
- L-SP2+ Compatible System

The LSP3A System Mode is default mode. In L-SP2+ Compatible System mode,read tag UID will be forced to be selected.

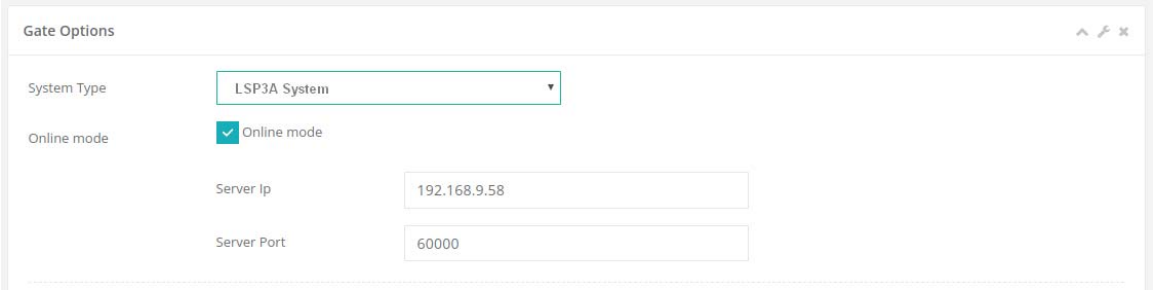


Figure 5.11: Online Mode

In this mode, the device will connect to the Server and when a tag is recorded, it will send the tag information to the server and will not actively alarm. Also read tag UID option will be forced to be selected and AFI1 Value will be forced to be 0x00(reading all tags).

Table 5.1:When the device reads the tag, the data format sent

SOF	CMD_ID	DATA_LEN	DATA
0x1e	0x60	n	Data len bytes

Example: 0x1e 0x60 0x08 0x11 0x22 0x33 0x44 0x55 0x66 0x77 0x88

Table 5.2:When the server needs the device alarm, the data format sent

SOF	CMD_ID	DATA_LEN
0x1e	0x51	0x00

Example: 0x1e 0x51 0x00

5.5.3.2 Alarm setting

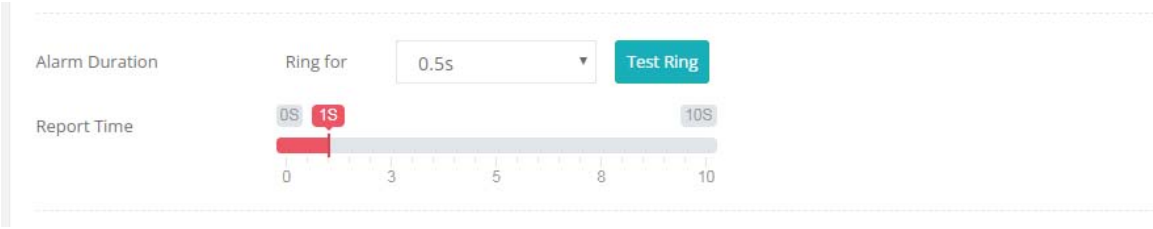


Figure 5.12: Alarm setting

In the "Alarm Duration" section:

- Select the alarm duration in the drop-list.
- Click "Test" to trigger an alarm (this is useful either to test alarm duration, or to identify the pedestal you're connected to).

5.5.3.3 Sycn mode

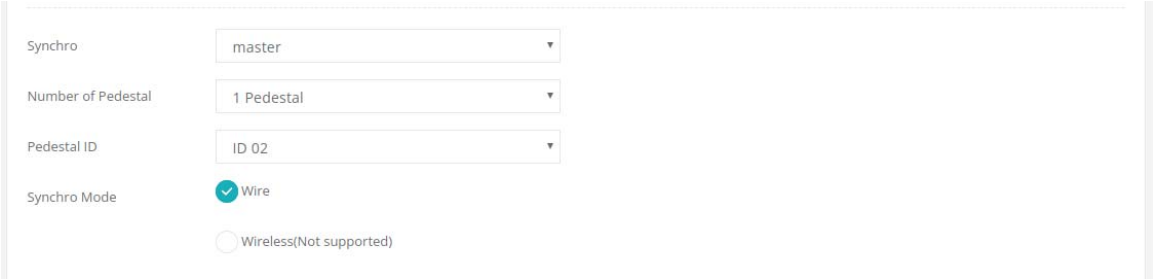
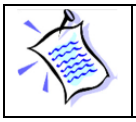


Figure 5.13: Sync setting

In the "Synchro" section:

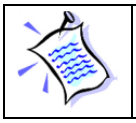
- Select whether the pedestal is to be configured as the Master or as Slave(1…8).
- Select the total number of pedestals(master and slaves) operating in close proximity and sharing the same ID.
- Select ID(master and slaves of one system installation must share the same ID).

	**Only one Master can be selected with several slaves.**

For example, in the library configuration shown below we have:

- System A with ID = 1(M1 Master, S1 S2, S3 Slaves).
- System B with ID = 2(M2 Master, S1 S2 Slaves).

The Masters are disposed as far as possible from each other not to perturb themselves. Two different IDs are used to be sure that each slave will be synchronized with the master from its own system.

	**At present, the synchronization module does not support wireless for the time being.**

5.5.3.4 Asynchronous Event Notification

Figure 5.14: Async setting

In this section, one can activate the useful Event Notification, a standalone feature which duplicates the database entry by sending to any PC on the network a data frame. This allows sending alarm data whenever an event occurs in any pedestal without having to regularly pool the pedestal database over the network. It limits the traffic over the network.

To activate the Event Notification, just tick at least one Event out of the 3 available. All Events can be selected if needed.

If IP address is left to the default "FF.FF.FF.FF" data is broadcasted to all equipments on the network. Possible Events are:

- People Counter Change: Whenever one walks through the gate passageway, data is sent over the network once. The Data field includes the new In Out and In + Out value.
- Alarms: Upon Tag(s) detection their UID & Memory Contents is sent over the network according to the settings defined.
- GPIO State Changes: Whenever an Input or Output level changes it is notified over the network. The data field reports the GPIO new status.

In this mode, when an event in the selected option occurs, a specific UDP message is sent to the specified IP address and port.

Table 5.3:Head

Version	Mac Addr	IP Addr	Date(M-D-Y)	Time(H-M-S)	Event ID
2bytes (default:0x0100)	6 bytes	4 bytes	3 bytes	3 bytes	1 bytes (Alarm:0x00, PeopleCount:0x01, GPIO:0x02)

Table 5.4: when people counter is changed, sent an UDP message

Head	InCount	OutCount
Head frame	4 bytes	4 bytes

Table 5.5: when device is alarming, sent an UDP message

Head	Alarminfo	TagType	RFU	DataLen	Data
Head frame	1 byte	1 byte	4 bytes	1 byte	Date_len's bytes

Table 5.6:when GPIO status is changed, sent an UDP message

Head	GPIO Status Mask
Head frame	GPIO1 high: 000000x1b(bit 0 is 1) GPIO1 low: 000000x0b(bit 0 is 0) GPIO2 high: 0000001xb(bit 1 is 1) GPIO2 low: 0000000xb(bit 1 is 0)

5.5.3.5 GPIO

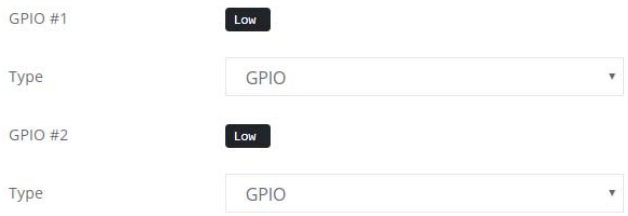


Figure 5.15: GPIO

GPIO1 has 3 types:

- GPIO
- Input Trigger
- Output Trigger

GPIO2 has 2 types:

- GPIO
- Output Trigger

Checking GPIO level

The two GPIO available to user can be monitored:

- Display shows "High" when voltage level is above 2 Volt.
- Display shows "Low" when voltage level is below 1 Volt

Clicking with the mouse on GPIO text field, the Level value toggles between High & Low.

The effect will depend on the actual GPIO settings on GPIO module.

GPIO1 can be set as an Input Trigger for RF powering off/on as well as an Output for driving an External Alarm Device.

GPIO2 can only be used as an Output for driving an External Alarm Device.

Configuring General Purpose Input/Output

When needed, port #1(GPIO1) can be used as an input to remotely switch the RF Field on and off. This is useful to limit the HF field generation to a strict minimum, i.e. whenever a person is about to enter the detection passageway crossing a light barrier placed ahead of the pedestal and keep it on for a fixed duration or whenever the person is exiting the RFID detection area using a second light barrier beam crossing detector.

Refer to Figure 5.17 for the pin layout to wire the Input and output signals.

In section GPIO1, select one of the available options:

- GPIO: Port has no predefined function; it can be driven remotely by Host PC via API.
- Input Trigger: when wired signal matches the Active Level Setting("Low" or "High") the Radio Frequency Field will be turned On, Theft detection becoming active.
- Output Trigger: when Theft is detected(EAS or AFI signal setting the alarm), the Port Signal level matches the Active Level Setting("Low" or "High"). The output voltage

level of the port should match the active voltage to set the external alarm device wired up.

In section GPIO2, select one of the available options:

- GPIO: Port has no predefined function; it can be driven remotely by Host PC via API.
- Output Trigger: when Theft is detected(EAS or AFI signal setting the alarm), the Port Signal level matches the Active Level Setting("Low" or "High"). The output voltage level of the port should match the active voltage to set the external alarm device wired up.

Whenever the GPIO is set as an Output Trigger, It is possible to set a pulse Width and a Pause in milliseconds: In Figure 5.16, the Pulse Width is set to 400ms. This means that whenever theft detection occurs, the signal on port#2 will go from low to high level for a minimum time of 400ms. If no further detection occurs before the 400ms timing laps, then signal will drop to low level.

Whenever after the Pause timing, if a new detection occurs, signal will rise again to high level.

In the particular case of the Pause Timing set to 0ms, whenever detection will occur timing equal to Pulse setting will be added up so that the active level will stay high as long as detection will occur (so called retrigger configuration).

Setting pause timing to a value different from zero will force the output signal to low level for Pause time after the Pulse time set, before being triggered again by a subsequent detection.

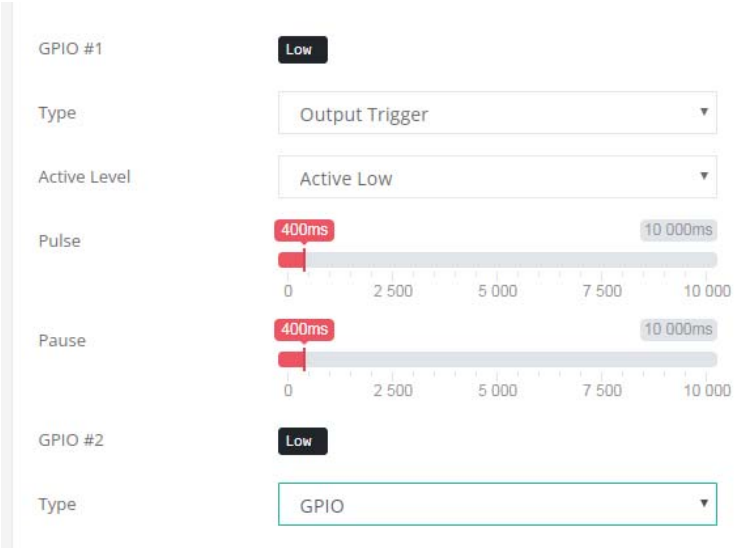


Figure 5.16: GPIO Output Trigger

Pin #	Function
1	Ambient Light +24V
2	Ambient Light 0V Ground
3	Alarm +24V
4	Alarm 0V Ground
5	GPIO #1 Open Collector
6	GPIO #1 0V Ground
7	GPIO #2 Open Collector
8	GPIO #2 0V Ground

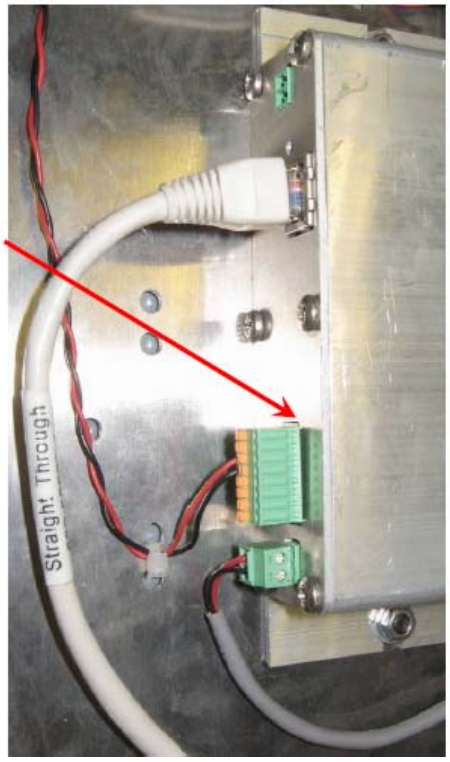


Figure 5.17: Peripherals & GPIO Green Connector Pin Out & Location

Table 5.7: GPIO Pins - Electrical Characteristics Max Ratings

Parameters	Min.	Typ.	Max.	Unit
Input Voltage Range	0	--	28	V
Input Voltage (Low Level)	0	--	0.9	V
Input Voltage (High Level)	1.5	--	28	V
Output Voltage Range	0	--	28	V
Maximum Continuous Output Current	--	--	1.4	V
Output Over Current Protection	1.9	2.8	3.8	V

In output mode the LSP3 GPIO can only sink current to ground. User needs to provide adequate DC Limited Current Supply to Port#1 and Port#2 (Open Drain).
See Figure 5.18 for detailed circuitry.

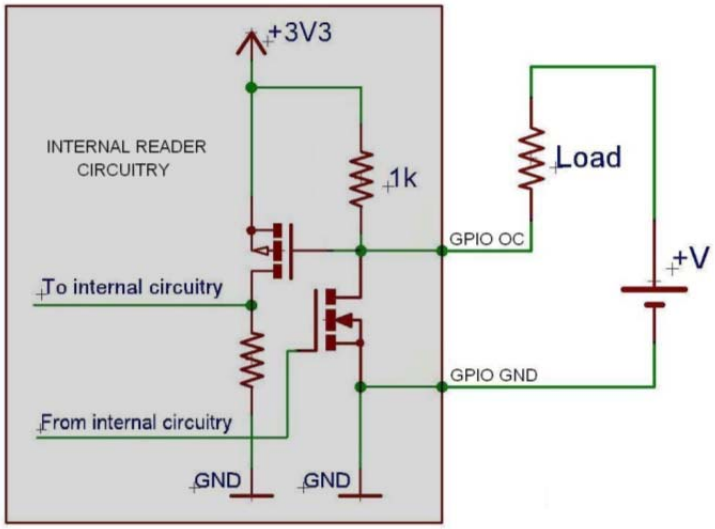


Figure 5.18: Internal Circuit of GPIO and External Supply Wiring in Output Mode

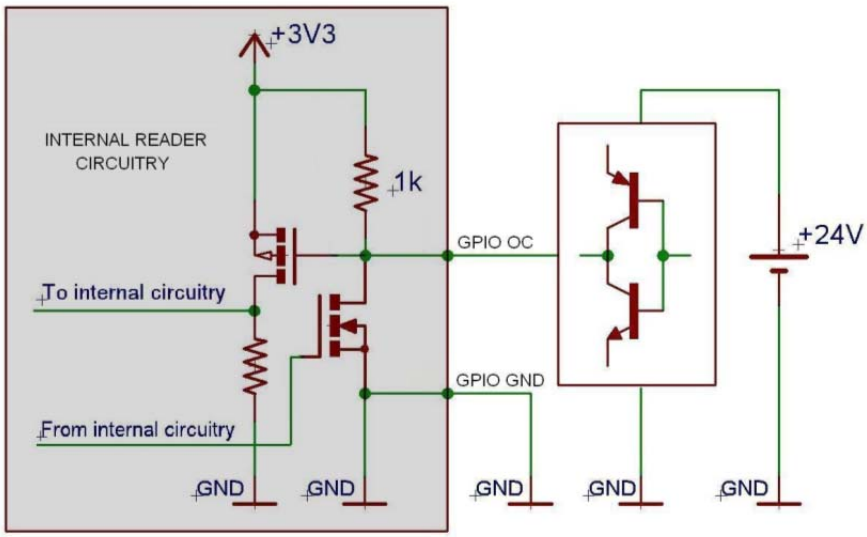


Figure 5.19: Connection of a Switch as an Input Device

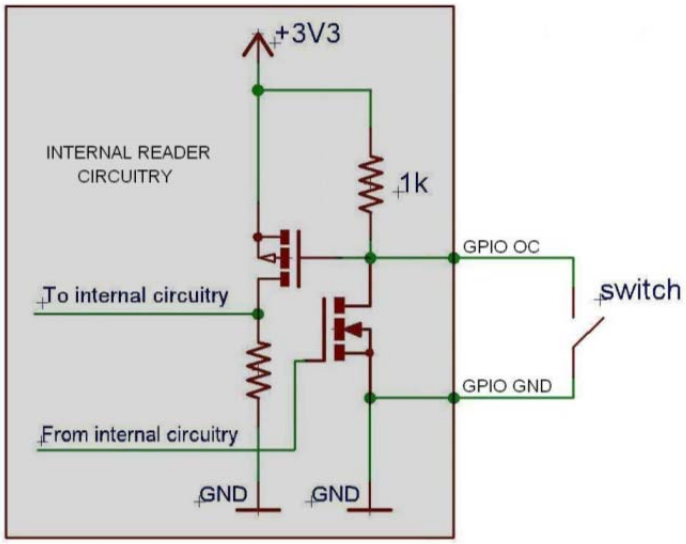


Figure 5.20: Connection of a Source and Sink Current Supply as an input Device

CAUTION	**Applying negative voltage may destroy the GPIO!** **Beware not to inadvertently toggle the GPIO from Input to Output Mode: you may create a short circuit when using a high current source to ground as an input device! Refer to Figure 5.20.**

5.5.3.6 People Counter

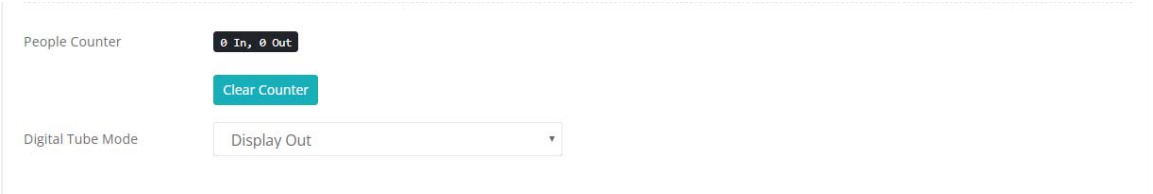


Figure 5.21: People Counter

The "People Counter" section displays the total number of people that crossed the IR sensor:

- Whatever the direction (In & Out) if no bidirectional IR sensor is installed.
- In each direction (In & Out) if bidirectional IR sensor is installed.

	People counter value is battery backed-up, and is consequently restored at power-up.

Click on "Clear Counter" button to reset people counter.

	To reset people counter, you can also use a pointed element (for example, a paper clip), insert it in the hole on the left of the display window and press (not too strong) until zero is displayed.

Use the drop-list in the "People Counter" section to select which count is to be displayed on pedestal LCD:

- "Display In" to display In counter only
- "Display Out" to display out counter only.
- "Display In + Display Out" to display the sum of In and Out counters.

	Pedestal must be rebooted for changes to take effect.

	The drop-list is not available if no bidirectional IR sensor is installed. In this case, pedestal LCD always displays the sum of In and Out counters.

5.5.4 Event of Detection

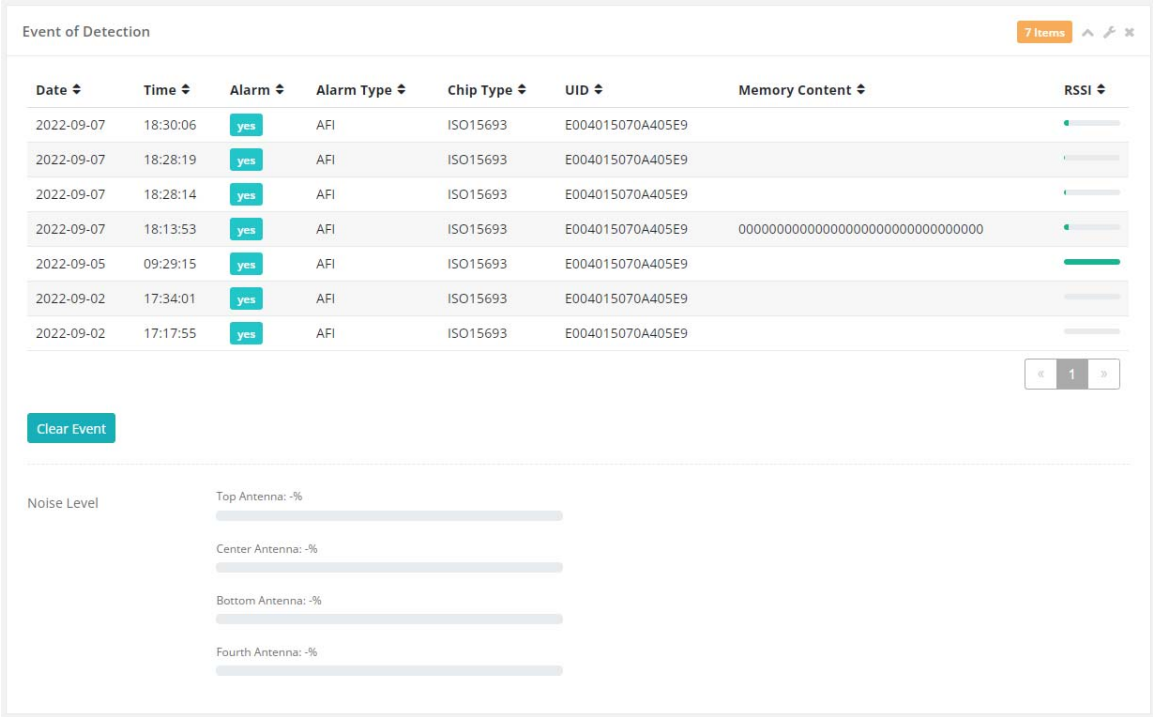


Figure 5.22: Event of Detection Panel

Each time an item(with EAS/AFI activated) passes through the gates an entry is added to a local database in pedestal memory. This entry holds the following information:

- The date and time to which the theft was committed.
- The chip type.
- If selected, the memory contents.
- If selected, the UID.
- The method used to detect the alarm(EAS or AFI).

The items shows the number of entries stored in pedestal memory in read-time.

Click "Clear Event" button to permanently erase pedestal database.

In "Antenna Noise Level" section, bar graphs provide a feedback regarding the ambient noise level measured by each antenna. It is only provided as debug purpose and should not be seen as a measure of performance. Green shows standard conditions as opposed to orange and red displays warning of possible/likely performance reduction due to ambient noise level.

5.5.5 Tag Modification

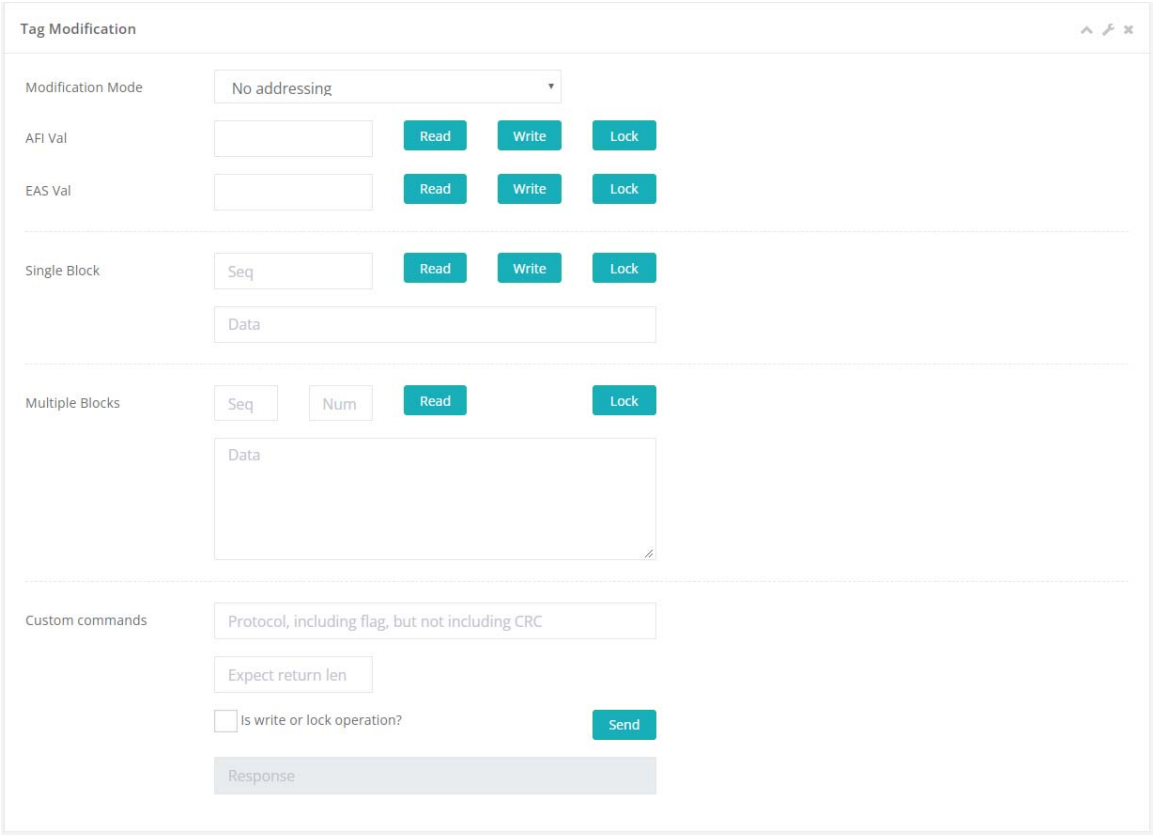


Figure 5.23: Tag Modification

The module can operate on a single tag, provided the tag is placed in the RF field. When the working antenna is single, the device will operate the tag within the RF field of the corresponding antenna. When the working antenna is in Normal mode or All Channel mode, the device will operate the tags in the RF field of the antenna through channel 2.

There are two ways to detect tags:

- No addressing
- UID(Detect with UID)

Click "Read" to read AFI/EAS/Signal Block/Multiple Blocks data.

Click "Write" to write AFI/EAS/Signal Block data.

Click "Lock" to lock AFI/EAS/Signal Block, data becomes read-only after locking.

	In "Custom commands" section, refer to "BS ISO-IEC 15693"

5.5.6 System Configuration

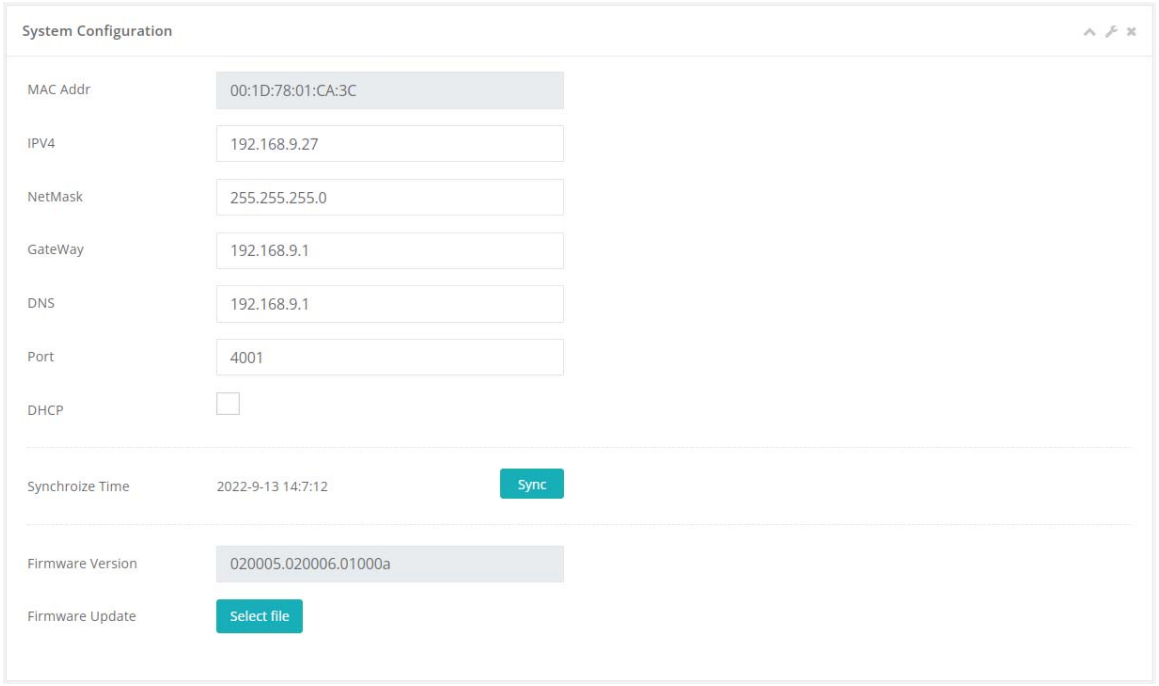


Figure 5.24: System Configuration

The main functions of this module are:

- Modify TCP/IP Configuration, including port.
- Synchronize the real time between the host computer and the device.
- Display device version.
- Upgrade firmware.

After modifying TCP/IP configuration, click "Apply Changes". You can then decide to apply the new TCP/IP configuration immediately by rebooting the pedestal, or to wait for next reboot to apply it.

When DHCP function is checked, the device will assign an IP address according to the DHCP server, and when there is no DHCP server, the device will use a static IP address.

When the Sync button is clicked, the host computer will send the local time to the device, and the device will modify its real time clock to synchronize with the host computer.

5.5.7 Update firmware

Ready the upgrade file as shown:

Figure 5.25: System Configuration

Click "Select file"，and then select the appropriate firmware file. A bar shows the progress of the upgrade process. The whole process will take 10 to 15 minutes and please do not power off. The device will reboot after the upgrade is complete.

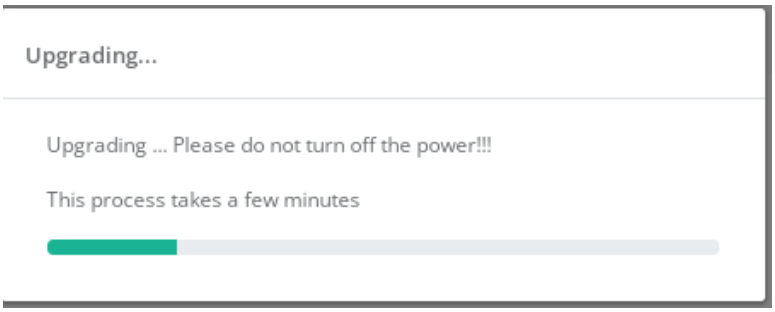


Figure 5.26: Upgrading process1

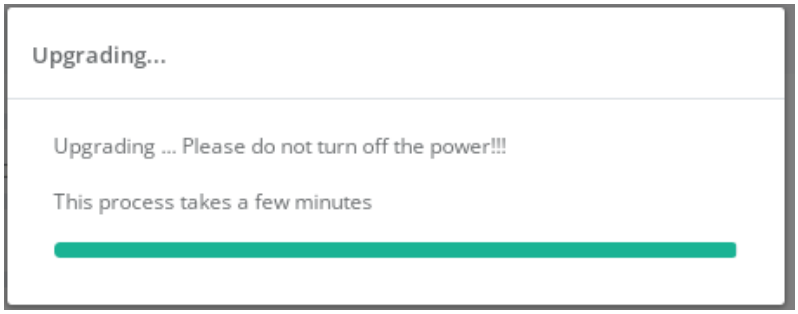


Figure 5.27 Upgrading process2

When the file transfer is completed, the device is decompressing and updating the relevant files, please wait for a while. After the update is completed, the prompt box is as shown below:

Figure 5.28 Upgrading process3

And the device will reboot.

5.6 People Counter & Buzzer Sound Management

5.6.1 Resetting the Counter Display

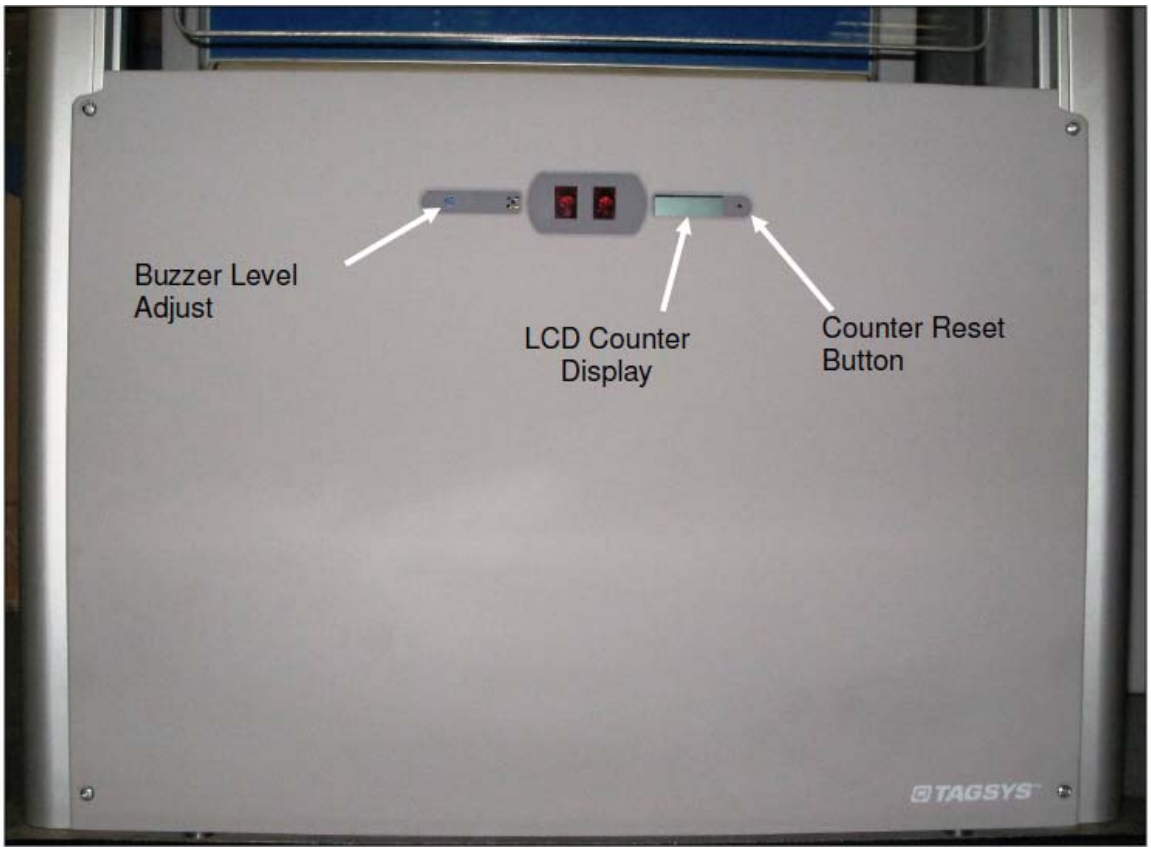


Figure 5.29: LSP3A People Counter & Detection Cells Location

To reset the LCD display use a pointed element (for example: a paper clip). Insert it in the hole on the right of the display window and press (not too hard) until you get zero displayed. This will also reset the battery backed-up counter.

5.6.2 Resetting the Remote People Counter

See section 5.5.3.6 People Counter of Monitoring Pedestal Activity for moreinformation.

5.6.3 Adjusting the Level of the Buzzer Sound

Using a flat headed 4mm screw driver (less than 4mm max diameter) through the outermost left hole, adjust the buzzer sound to the desired level turning clockwise or anticlockwise.

To trigger the alarm during the trimming operation, either use a book with an EAS set label or depress the Test Button on the Basic Configuration Tab of the LSP3A Configuration Tool.

6 Operation

6.1 Theory of Operation

The RF motherboard in the electronics unit produces radio frequency (RF) electromagnetic signals that are transmitted via the antennas in each pedestal. Each antenna transmits for a short period, receives for a short period, and is inactive for the remainder of the time.

6.2 Starting the System

There is no ON/OFF switch. The system operates when mains power is applied plugging in the IEC plug into the Wall mounted plug.

6.3 Normal Operation

No operating procedures are required. The system continues to operate as long as power is supplied.

6.4 Shutdown

Once the system is set up and running, we recommend that all pedestals remain turned on at all times.

7 Maintenance

7.1 Servicing the Pedestals

No regular servicing or maintenance is required, except for keeping the covers clean, and occasionally checking the integrity of the cover seals.

It is recommended that the pedestal unit be inspected at least once per year by an approved INVENGO technical representative.

Refer to section 1.2 "Care and Maintenance" for general maintenance information.

If needed, individual spare parts are available upon demand. Refer to the Table 7.1 here below:

Table 7.1: Spare Parts

Part to be replaced	Reference on Figure 7.1
Power Supply Unit **PSU**	C
XC-RF300 Gate Reader **PEM**	B
People Counter complete Module	A

7.2 Electronic and Power Supply Location

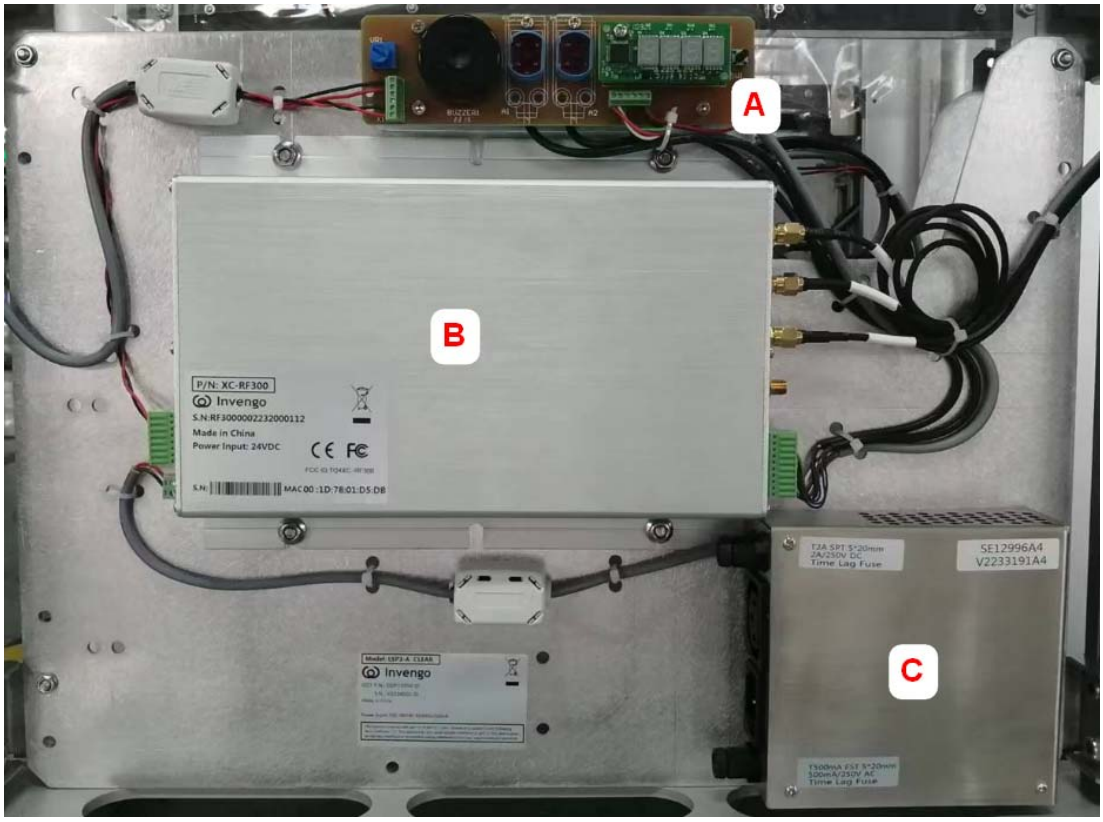


Figure 7.1: Latest LSP3A Clear PEM and Power Supply Unit Location Bottom right

On LSP3A Clear Model PEM, Peripherals and Power Supply Units are located at the same place. Refer to Figure 7.1: Latest LSP3A Clear PEM and Power Supply Unit Location Bottom right.

When removing the Plastic decorative parts, on can gain access to the PEM modules,

People Counter, Buzzer Settings and Extra optional display Lights beneath the PEM.

7.3 Servicing the Electronics Unit

- Fuse characteristics:
  - F1 on AC mains: SCHURTER FST, 5X20mm, Time-Lag T, H, 250VAC, 500mA
  - F2 on DC supply: SCHURTER SPT, 5X20mm, Time-Lag T, H, 250VAC/300VDC, 2A

- How to change them:

Fuses are located behind the plastic cover at the bottom of the LSP3A pedestals.

1. Unscrew the 4 screws holding the plastic cover on sensors and counter display side.
2. Unscrew the fingertip head fuse and replace the tripped fuse with the specified replacement one. Only use the specified UR listed 5x20mm fuses from SCHURTER for replacement (please see figure below).

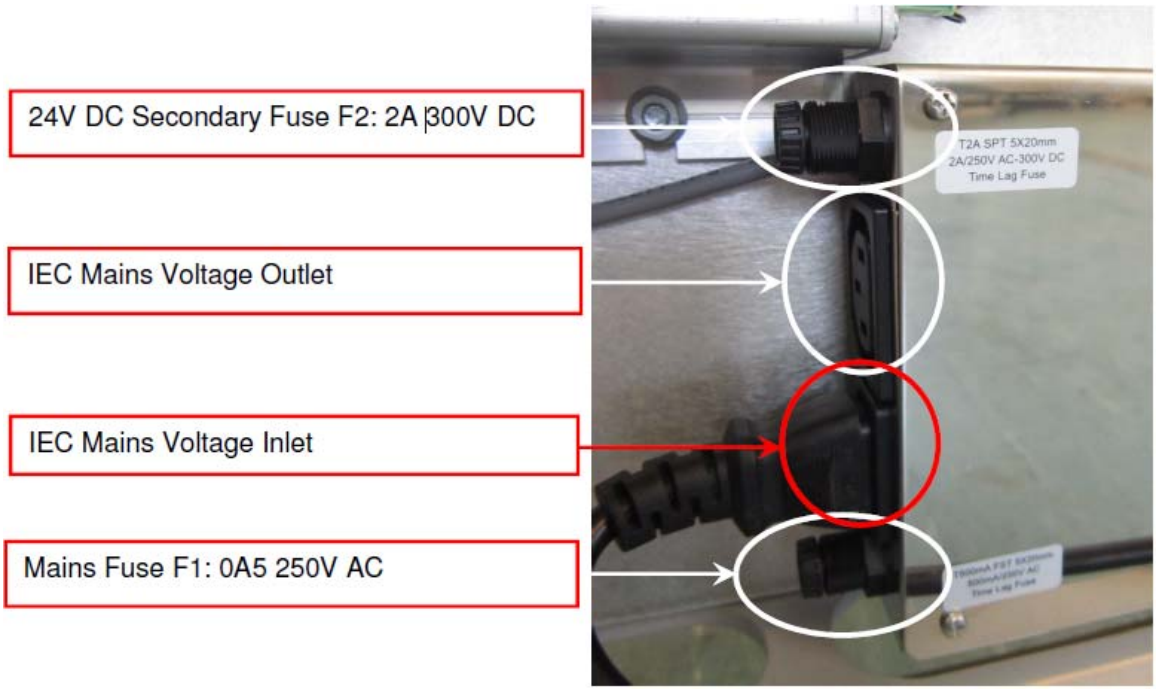


Figure 7.2: Mains Fuses Location and Ratings

CAUTION	**WARNING: Beware of Hazardous AC mains 110/230V Voltage!** **Make sure there is no power supply before carrying on maintenance operation.To do so, the micro circuit-breaker must be opened and the Main Power SupplyCord Unplugged from the Wall Socket.**

8 Troubleshooting

The following table lists the most common problems and describes their solutions.

Table 8.1: Troubleshooting Table

Fault	Possible Causes	Solution
No power	**Differential or micro circuit breakers**	**Check the differential and micro circuit breaker status**
	System fuse	**Replace fuse**
	Cabling fault. Power cable fault	**Check cabling and connections. Replace any suspected faulty cables.**
Alarms missed (INVENGO RFID tags with theft bit ON not triggering alarms).	**Tuning fault**	**Check antenna tuning**
False alarms (INVENGO RFID tags with theft bit OFF trigger alarms).	**Tuning fault**	**Check antenna tuning**
	Nearby devices are interfering with the pedestals. (Refer also to section 0)	**Switch off all or some of the suspicious nearby devices and check if the EAS detection performance changes. (If it does, check for a power problem with the pedestal)**
Fail to connect to Pedestal via Ethernet Cable	**Wrong Ethernet cable Check Gateway & network settings**	**Use a crossed Ethernet Cable to directly connect Pedestal to PC. Set to default Address. Refer to Chapter 5.5.6**

8.1 Sources of Interference

The following devices may cause interference with EAS systems if they are close to the pedestals:

- INVENGO RFID tag readers and programming devices
- computer monitors or screens (cathode ray tubes)
- radio transmitters
- short-wave radios
- high power music systems with D-class amplifiers
- some industrial vacuum cleaners
- high-frequency fluorescent lights (if very close to pedestals)
- neon or halogen lights such as advertising signs
- equipment using switch mode power supplies
- data or power cables within 400 mm
- illuminated exit signs generating noise between 80 and 100 kHz
- digital phone lines (wideband noise) within 200 mm

	**These distances are subject to site variables. Distance may be smaller under some conditions. Metal frames on furniture and fixture items may interfere with the EAS system if they are too close. This is because energy from the antenna can couple into the metallic frame and be transmitted to INVENGO RFID tags and antennas several meters away.**

9 Technical Specifications

9.1 Mechanical Data LSP3A Clear

Parameter	Value
Weight	Pedestal: 26.2 kg (57¾ lbs)
Pedestal Dimensions (HxWxD)	Approx. 1870 mm x 550 mm x 45 mm (73½ x 21¾ x 1¾ in) excluding base plate.
Connections to pedestal	IEC Supply Power Cord and Ethernet Cable

9.2 Electrical Data LSP3A Clear Model

Parameter	Value
Power supply	100/240 Volts AC, 0.5 A, 50/60 Hz
Power consumption	25 W max
Conformity	CE, EN 60950-1, EN 50364
Microchip compatibility	C370-L (NXP SLI-L), Tag-it ™HFI (TexasInstruments), ISO 15693 supporting AFI and read multiple block command: LRI-2K & EM4233
Operating temperature	0 to 40 °C (32 to 104 °F)
Storage temperature	-20 to 60 °C (-4 to 140 °F)
Fuse on AC mains	Schurter FST, 5X20mm, Time-Lag T, H, 250VAC, 500mA
Fuse on DC supply	Schurter SPT, 5X20mm, Time-Lag T, H, 300VDC, 2A

9.3 LSP3A Clear Mechanical Drawings

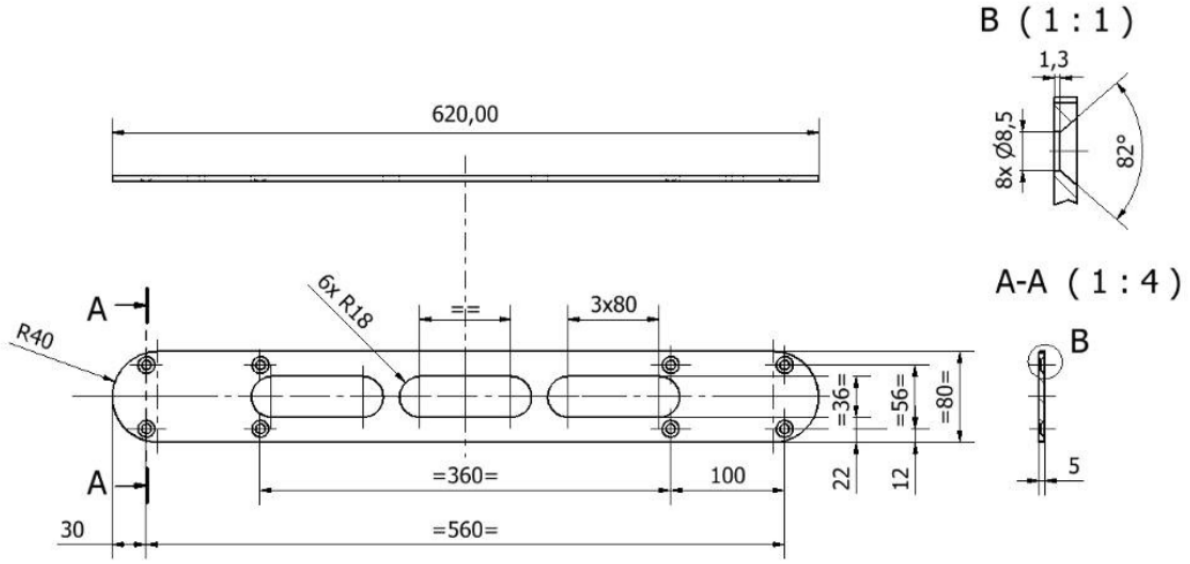


Figure 9.1: LSP3A Clear Pedestal Base Fixing Plate Dimensions

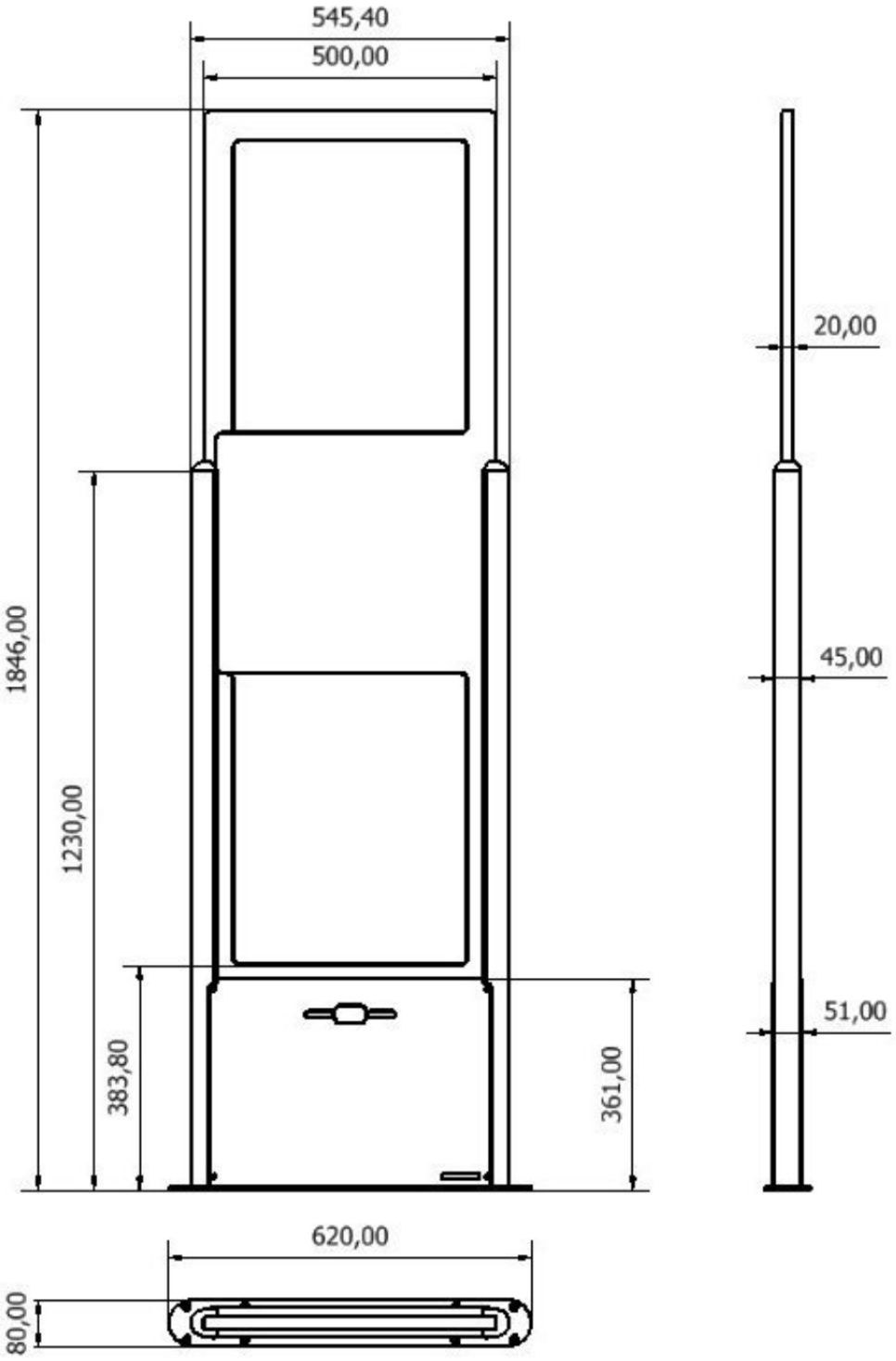


Figure 9.2: Outer Dimensions of LSP3A Clear Panel

10 Performance Test

10.1 Test Conditions

- Distance between each pedestal not greater than the maximum recommended distance of 915mm (3 ft.).
- All tags used must have the theft bit set. Use of reference tag (Antenna Tuning Kit Test Card) is strongly recommended for repeatable results.
- Testing to be carried out at walking pace (maximum of 1 meter/second).
  Metal, conductive materials, human hands or body must not shield tags.
- All books must have tags inserted according to the 4 positions; 20-mm offset grid recommendation.
- Minimum thickness of books should be 16 mm
- Each EAS system shall be installed, commissioned, tuned and operated according to INVENGO instructions.

10.2 Test Procedure

1. Divide the gate into 15 test zones as shown. Tip: Use masking tape to temporarily mark the floor and pedestals.
2. Using the locked reference tag(s), walk through the gate positioning the tag in the center of each zone.
   (Start at test zone 1 and sequentially test each zone in turn)
3. If either or both pedestals sound an alarm, indicate the zone box with a check mark. If neither sounds an alarm, indicate with a cross.
4. Repeat the test with the tag in three orientations for each zone. (Vertical, Horizontal & Facing positions)
5. Mark the random tests with a check mark or cross inside a triangle in the appropriate test zone.

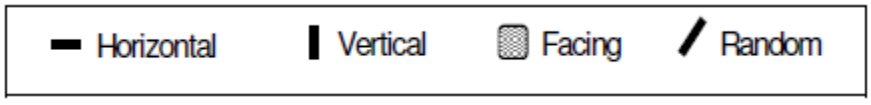


Figure 10.1: Tag Orientation

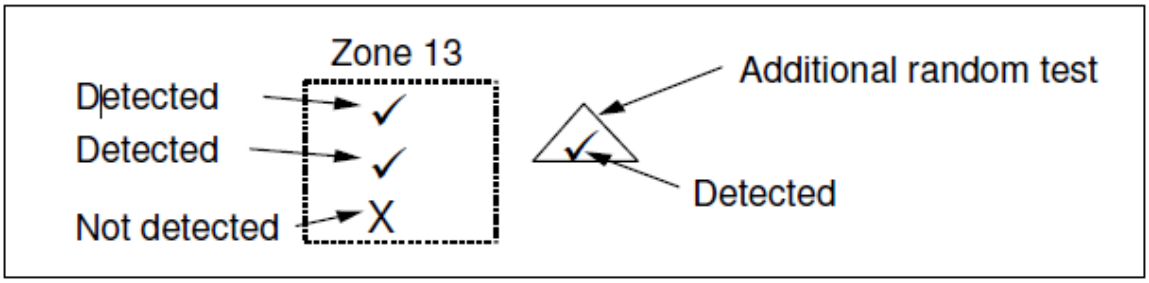


Figure 10.2: Example

LSP3A EAS Performance Test

Library / Facility installed: _____

Location of Pedestals: _____

Specific installation notes: _____

Pedestal A	Pedestal B
S/N:	S/N:
Software Version:	Software Version:

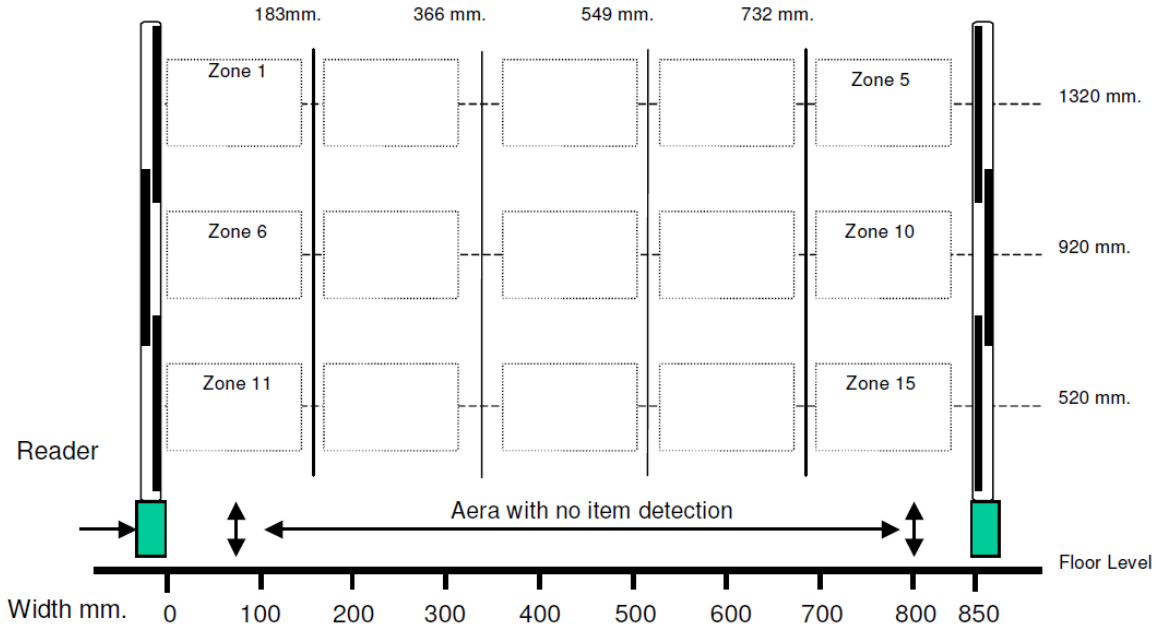


Figure 10.3: Test Chart

Number of Tags used: _____ Alarm lights working OK (Y/N) _____

Serial number(s) of reference Tag(s): Buzzers functioning OK (Y/N) _____

_____ Test Result _____%

Test comments: _____

_____

Tested By: Name: _____ Company: _____

Signature: _____ Date _____

11 Warranty Conditions

INVENGO warrants that its LSP3A shall comply with the functional specifications set forth herein for a period of one year from the date of delivery to the Buyer.

This warranty is valid for the original Buyer of the Product and is not assignable or transferable toany other party.

INVENGO cannot be responsible in any way for, and disclaims any liability in connection with the operation or performance of:

- Any product in which the Product is incorporated;
- Any equipment not supplied by INVENGO which is attached to or used in connection with the Product; or,
- The Product with any equipment.

This warranty only applies to the Product and excludes all other equipment.

Optimal operation and performance of the Product are obtained by using INVENGO' readers, by applying INVENGO installation guidelines and by having your installation reviewed by a CIT (Certified Integrator by INVENGO) technical consultant.

The INVENGO warranty does not cover the installation, maintenance or service of the Product and is strictly limited to the replacement of Products considered as defective by INVENGO and returned according to the return procedure defined below; in such case, INVENGO will, at INVENGO' option, either replace every defective Product by one new Product or refund the purchase price paid by Buyer to INVENGO for the defective Product.

11.1 Warranty Exclusions

The following conditions are not covered under the warranty:

- Defects or damages resulting from storage of the Product under conditions that do not comply with INVENGO specifications or normal usage.
- Defects or damages resulting from use of the Product in abnormal conditions (abnormal conditions being defined as any conditions exceeding the ones stated in the product specifications).
- Defects or damages from misuse, accident or neglect.
- Defects from improper testing, operation, maintenance or installation.
- Defects from alteration, modification except modifications or adjustments specifically described in this Product reference guide, adjustment or repair, or any attempt to do any of the foregoing, by anyone other than INVENGO.
- Any action on the product that prevents INVENGO to perform an inspection and test of the Product in case of a warranty claim.
- Tampering with or abuse of the Product.

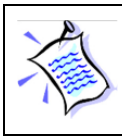
- Any use or incorporation by the Buyer or a third party of INVENGO' Product into life saving or life support devices or systems, or any related products; INVENGO expressly excludes any liability for such use.

11.2 General Provisions

This warranty sets forth the full extent of INVENGO responsibility regarding the Product. In any event, INVENGO warranty is strictly limited to (at INVENGO' sole option) the replacement, the repair or refund of the Products purchase price to INVENGO, of Products considered as defective by INVENGO.

The remedy provided above is in lieu and to the exclusion of all other remedies, obligations or liabilities on the part of INVENGO for damages, whether in contract, tort or otherwise, and including but not limited to, damages for any defects in the Products or for any injury, damage, or loss resulting from such defects or from any work done in connection therewith or for consequential loss, whether based upon lost goodwill, lost resale profits, impairment of other goods or arising from claims by third parties or otherwise.

INVENGO disclaims any explicit warranty not provided herein and any implied warranty, guaranty or representation as to performance, quality and absence of hidden defects, and any remedy for breach of contract, which but for this provision, might arise by implication, operation of law, custom of trade or course of dealing, including implied warranties of merchantability and fitness for a particular purpose.



In all cases, specific warranty conditions as described in the sales contract will always prevail.

11.3 How to Return Defective Products

The Buyer shall notify INVENGO of the defects within 15 working days after the defects are discovered.

Defective Products must be returned to INVENGO after assignment by a INVENGO Quality Department representative of an RMA (Return Material Authorization) number. No Products shall be returned without their proof of purchase and without the acceptance number relating to the return procedure.

All Products must be returned in their original packaging.

All Products shall be returned with a report from the Buyer stating the complete details of the alleged defect.

Call +86 400-888-0058 for return authorization and shipping address.

If returned Products prove to be non-defective, a charge will be applied to cover INVENGO' analysis cost and shipping costs.

If the warranty does not apply for returned Products (due to age, or application of a warranty exclusion clause), a quote for replacement will be issued, and no replacement will be granted until a valid purchase order is received. If no purchase order is received within 30 days after the date of INVENGO quote, INVENGO will return the products and charge the analysis cost and shipping costs.

All replaced Products shall become the property of INVENGO.

The Product Return Form is included on the following page. This form should accompany any product you need to return to INVENGO for analysis in the event of a problem.

Product Return Form

Customer Profile:

Company:.....

Address: .....

City & State: .....

Zip Code: .....

Country: .....

RMA Number : .....

Date : .....

Contact Name: .....

Contact e-mail: .....

Contact Phone:.....

Contact Fax: .....

Order identification:

Serial or Batch nr :.....

Product Name: .....

Return Quantity: .....

Reason for return:

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To inform INVENGO of this return, please email it to

nbmarket@invengo.cn

Address to ship the product with this document attached:

28 Floor, High-Tech Zone Rong Chao UnionTown,No 63 XueFu road,Nanshan District, Shenzhen ， P.R China

To inform INVENGO of this return, please also fax it to your Customer Service Representative : +86 574-87399744

Return Procedure:

In order to give you a RMA number, please fulfill this document and send it by return to the above email address or to your Customer Service Representative. Please write the RMA number on the outside of the box. The product returned will go through stringent quality controls. If the product is no longer under warranty, a final analysis report will be sent to you as soon as possible as well as a quotation for repair.

Quotation :

In case of no product repair coverage by INVENGO or product out of warranty period, any quotation will be charged to a fixed price of 100 € per product.

This amount will be deducted of the repair price in case of the quotation acceptance, or will be kept by INVENGO in case of quote refusal or no answer within 2 weeks. If quote is accepted the product will be return on an Exworks basis.

After receiving quote, in case of no answer within 2 weeks, INVENGO will be entitled to destroy the product.