PAS

Pedestrian alert on forklift trucks

Operator's and User's Manual

CE

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"This system is designed to increase the safety of a forklift truck. Under no circumstances should it be considered as a certified and approved personal safety system."

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1. APPLICATION

This manual contains the information required for correct maintenance and operation of the system.

ICNITA professionals will inform you about how the system operates.

Read this manual carefully before using the system so that you are familiar with its operation.

Please contact us should you have any doubts or queries.

PAS is an electronic safety system whose primary function is to warn the forklift truck driver that a person (wearing a t-10 safety transponder) has entered the exclusion zone.

"This system is designed to increase the safety of a forklift truck. Under no circumstances should it be considered as a certified and approved personal safety system."

2. GUARANTEE

Our product has a 1-year service guarantee for material or construction defects provided the instructions included in this manual have been followed correctly.

ICNITA declines any responsibility for defects that may appear during the guarantee period when:

- The instructions included in this manual have not been observed.
- Any repairs have not been made by our professionals
- The failure has been caused by abnormal wear or erosion
- Unauthorised replacement parts have been used
- The system has not been used correctly

3. FCC REGULATIONS

FCC Statement

DECLARATION OF CONFORMITY WITH FCC RULES FOR ELECTROMAGNETIC

COMPATIBILITY

Model: AC-50

We, Icnita S.L. declare under our sole responsibility that this device, AC-50 with 2,4Ghz radio specs to which this declaration relates, complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

Caution: Exposure to Radio Frequency Radiation.

The device shall be used in such a manner that the potential for human contact during normal operation is minimized.

The antenna shall be placed in such a manner to minimize the potential for human contact during normal operation. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Federal Communications Commission Notice

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 and correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the distance between the equipment and the receiver.

• Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment for Portable usage conditions as per Rule Part 2.1093.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter except as indicated in the FCC listing.

2 .4GHz operation of this product in the USA is firmware-limited to channel 25 (2475 Mhz)

Modifications

The FCC requires the user to be notified that any changes or modifications to this device that are not expressly approved by Icnita S.L., may void the user's authority to operate the equipment.

4. IC REGULATIONS

IC Statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

5. OPERATION

There is communication between the personal tag and the antenna on the forklift truck in situations of danger, that is, when the exclusion zone around the forklift truck has been invaded.

The safety system then triggers a warning signal (acoustic and visual alarm).

The purpose of the Test Tag on the forklift truck is to ensure that the system is operative as an indispensable condition for using the forklift truck.

Whenever a person wearing a T-10 safety transponder enters the danger area, the T-10 safety transponder is electronically detected, activating the warning systems on the forklift truck.

6. SYSTEM COMPONENTS

The **PAS** safety system consists of 6 modules:

- Activator antenna (AC-50)
- LF antenna
- Self-control tag (TT-50)
- Safety transponder (T-10)
- Transponder test antenna (AV-50)
- Control software SW-10

Activator AC-50	LF Antennas	Test tag TT-50	Personal Tag T-10	Test antenna AV-50	Control software SW-10
					
PN08446	PN08484	PN09100	PN09394	PN09101	PN09252

6.1. Accessories:

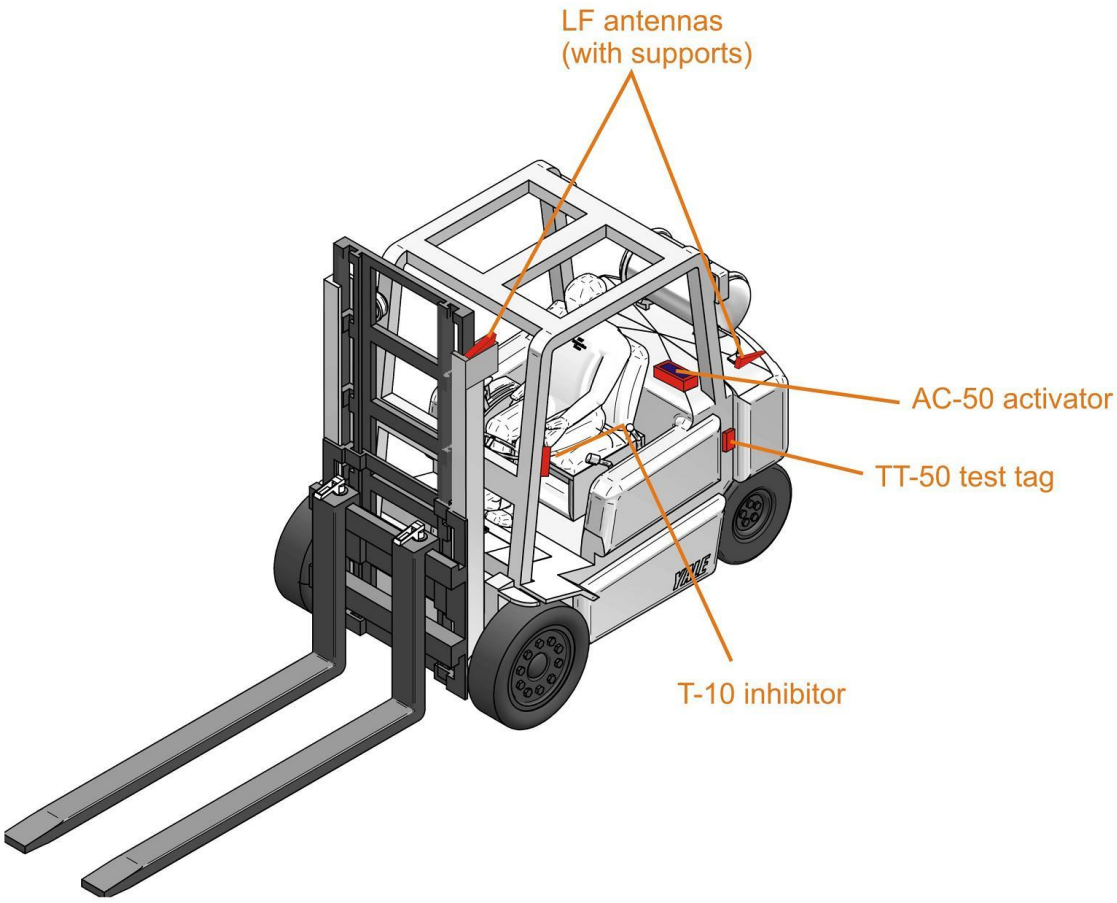
Support for LF antenna	T-10 Inhibitor
	
PN09287	PN09112

7. DESCRIPTION OF THE SYSTEM

Solution for the prevention of workplace accidents, especially designed for companies where there is the risk of collision with pedestrians sharing work areas with forklift trucks.

The system is comprised of 6 elements; an electronic tag fitted to the safety vest, the tag detector antenna installed on the forklift truck, the LF antennas on the forklift trucks, a tag test antenna, a self-control test tag, and the control software

The system is operative whenever a pedestrian or visitor wearing the safety vest validates the status of the tag using the AV-50 test antenna (100% operative) before entering the controlled area.



7.1. AC-50 Activator

The AC-50 activator is comprised of a box containing the system electronics and connected to two decoupled LF antennas. These antennas are located on a special support on the forklift truck.

AC-50 Activator | LF Antennas | Support for LF antenna

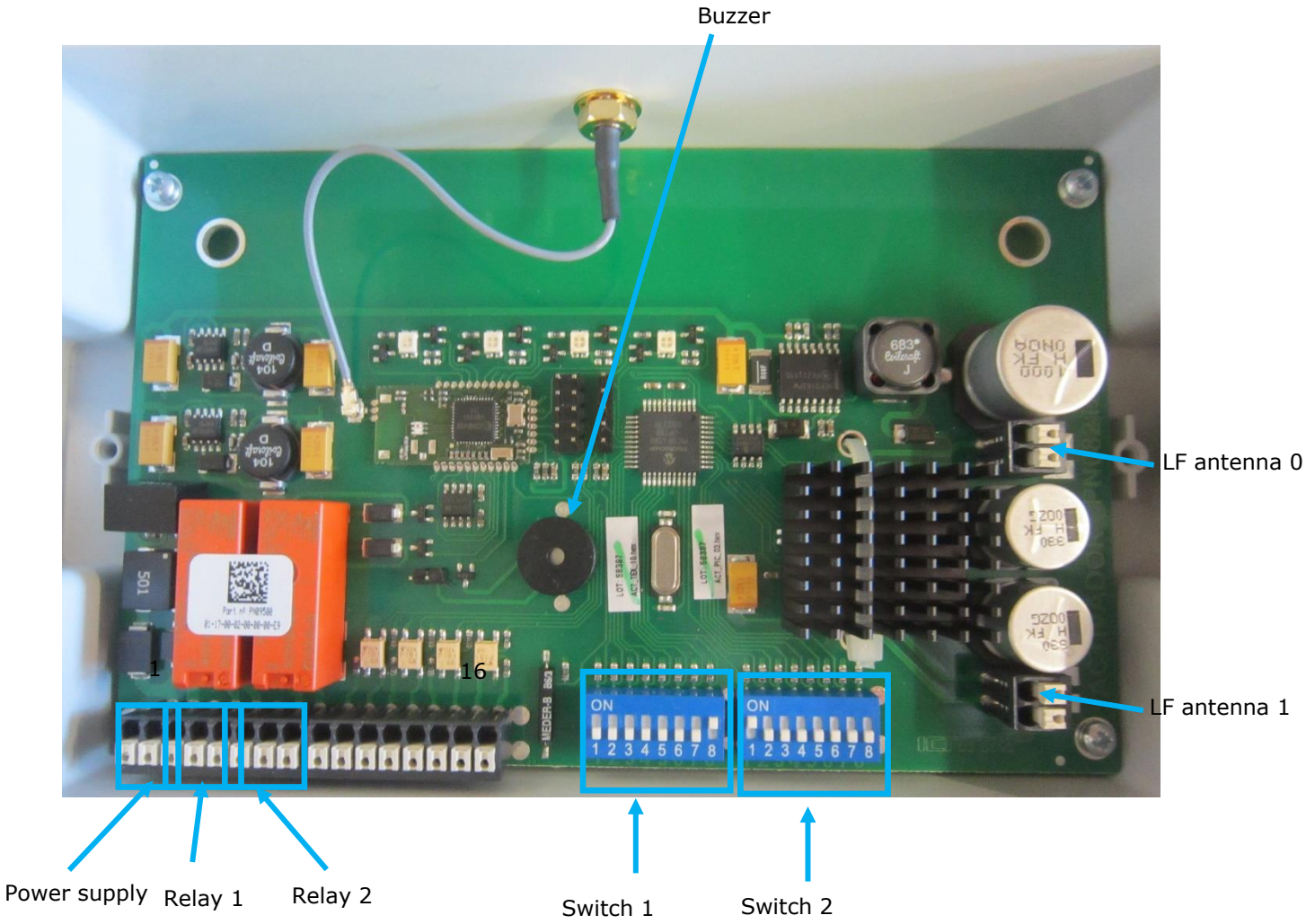
The activator is comprised of one rigid antenna and two decoupled antennas supplied with **5 m of connecting cable.**

The activator AC-50 can be positioned in the front panel of the forklift or in any other place inside the cabinet of the forklift. There are no restrictions to positioning it as RF exposure conformance has been demonstrated for close proximity of the equipment operator to the AC-50 (<5mm), the only thing to have in consideration is the 2,4GHz antenna will be in vertical position.

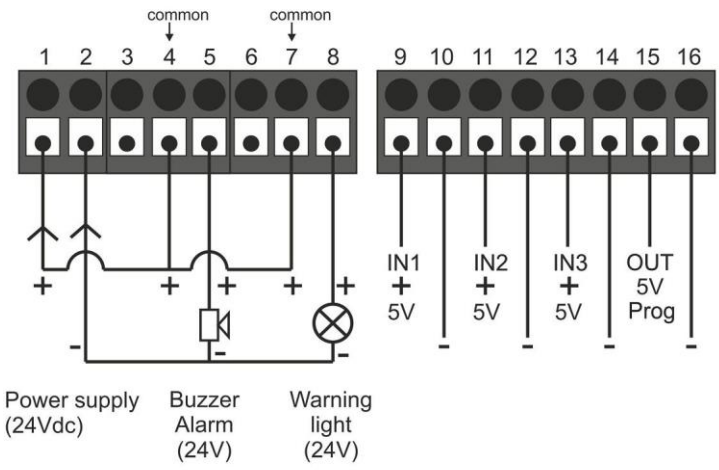
These LF antennas are positioned on the forklift truck to cover the required exclusion zones. They may be located close to the activator or on any part of the forklift truck.

Antennas should not be fitted to the forks of the forklift truck because they move and the protected area will not be constant.

7.1.1. Distribution of the components of the AC-50 activator:



Wiring diagram:



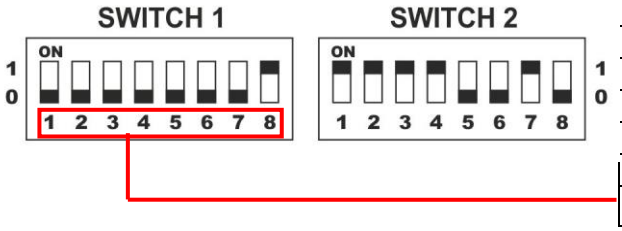
7.1.2. Adjusting the unit code:

Each activator in the facility must have a different code. If there is more than one activator with the same code the system will malfunction.

SWITCH 1

There must always be one forklift truck that acts as the coordinator. Switch 1 of its activator must be configured as follows: **00000001**

Whenever there is more than one forklift truck, all other activators must follow combinations of **switch 1** without repeating any of them and as shown in the following table

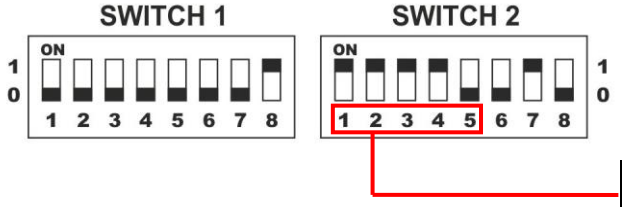


Deactivated	00000000
Not used	11111111
Address 1	00000001
Address 2	00000010
Address 3	00000011
Address 254	11111110

7.1.3. Selecting the magnetic field strength: **(detection distance)**

SWITCH 2

The strength of the magnetic field should be adjusted to cover both the front and rear detection distances for personnel wearing a T-10 tag. The magnetic field has 7 strength levels that are adjusted using **switch 2** as shown in the following chart:

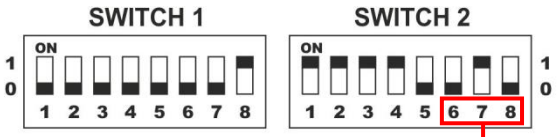


(Positions 6-7-8 are not applicable to the strength)

Deactivated	00000
Strength 1 (min.)	00001
Strength 2	00100
Strength 3	01010
Strength 4	10000
Strength 5	10100
Strength 6	11100
Strength 7	11110
Strength 8 (max.)	11111

7.1.4. Adjusting the operating mode

Each activator must perform its particular operation and this requires adjusting positions 6-7-8 of SWITCH 2.



Activator without Test	000
Activator with Test tag	010
Battery test antenna	100
Not used	110

7.1.5. Explanation of AC-50 LEDs

The status of the system is displayed by 4 LEDs:

- RUN
- TAG
- L1
- LF

RUN LED

The RUN LED has 3 possibilities:

Colour		Meaning
Off	■■■■	There is no power supply and therefore no Zigbee
Intermittent Red	■■■■	There is no Zigbee but there is a power supply (error)
Green	■■■■	There is Zigbee and power supply (connected status)

TAG LED

The TAG LED has 3 possibilities:

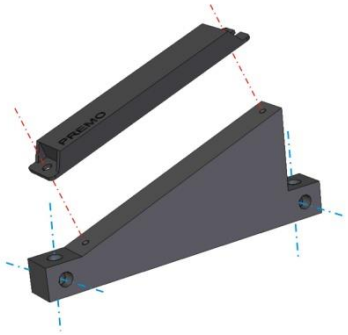
Colour		Meaning
Off	■■■■	No detection (Normal status)
Flashing red	■ ■	Test tag detection (Normal status)
Red	■■■■	Test tag malfunction
Intermittent red	■■■■	Configuration failure
Orange	■■■■	Tag detected
Green	■■■■	Button

LF LED

The LF LED only indicates whether there is LF signal.

Colour	Meaning
Off	No LF signal (error)
Flashing green	The LF antennas transmit signal (Normal status)

7.1.6. Support for LF antenna:

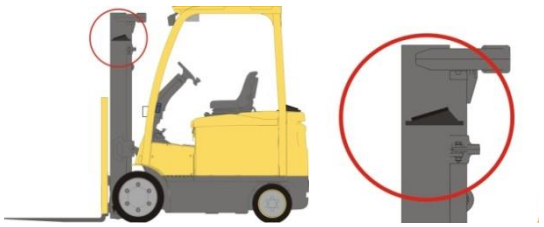


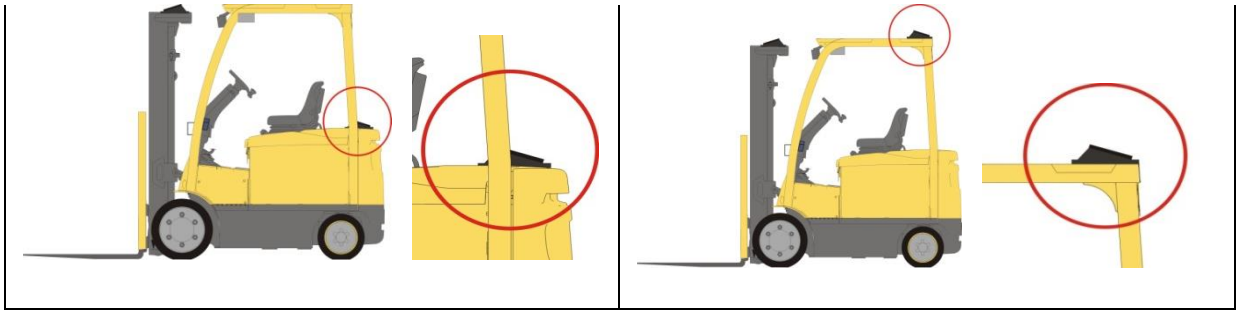
The LF antenna support is used to mount the LF antennas on the forklift truck chassis.

These supports are designed to optimise the antenna reception angle.

7.1.7. Placing the antennas on the forklift trucks:

Ensure optimal operation of the system by placing the LF antennas in the possible locations shown below. (Place one antenna as far away as possible from the other)

Front antenna: (mounted on a non-moving part of the forklift truck)	
	 (use the support separators)
Rear antenna:	



7.2. AV-50 test antenna

The test antenna is designed to detect the operational status and battery condition of the personal T-10 tags.

Apart from checking the battery condition, they also control the RF signal.

7.2.1. Explanation of AV-50 LEDs

Colour / Sound	Meaning
Green	Tag OK
Red + buzzer	Tag with low battery
Off	Tag not detected

Under normal conditions this type of battery has a service life of about 1 to 2 years.

The battery reference is: MAXELL CR2450

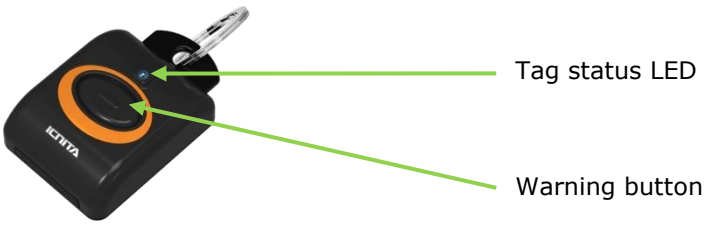
7.3. T-10 Personal Tag

The T-10 Personal Tag is a small, long lasting, active RFID device that can be hung from the key ring support supplied, a strap around the neck, or fitted into the safety vest.

Characteristics:

- Long battery life
- Call button:

Each time the button is pressed, a signal is sent to the closest activator. The distance detection is 20 metres.



7.3.1. T-10 Inhibitor

The T-10 inhibitor is a plastic holder located inside the forklift truck cabin.

Its purpose is to deactivate forklift truck driver's tag.

It is mounted on the forklift truck by an adhesive strip.

7.4. Test tag. (TT-50)

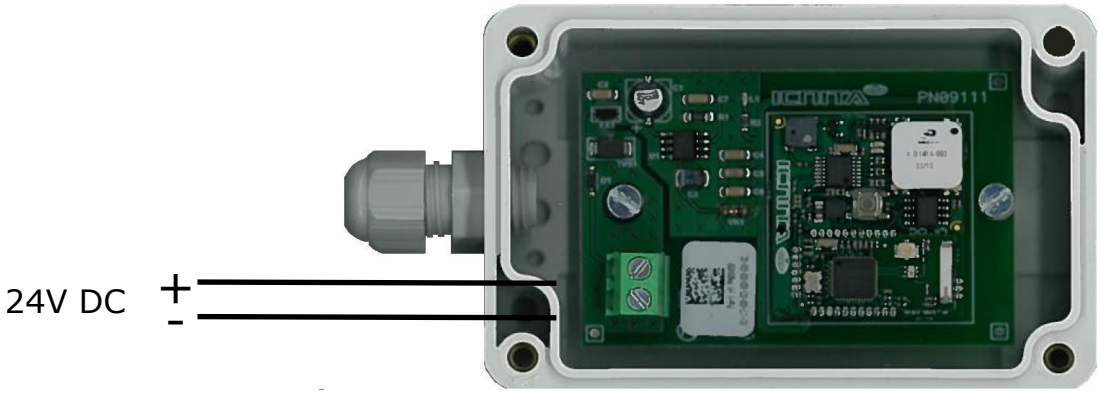
TT-50 is a small device located on the forklift truck.

It is in constant communication with the Activator to ensure the system is operating correctly.

If the activator stops transmitting, the test tag will set the activator to failure mode.

A 24 V DC power supply is required.

7.4.1. TT-50 wiring diagram


24V DC
+
-
PN09111

8. ADDITIONAL INFORMATION – ASSEMBLY RECOMMENDATIONS

Activator (AC-50):

Should be mounted inside the cabin area. May be mounted horizontally or vertically, but it must be fixed in place by all four screws.

Silent blocks (M5 male/female) should be placed between the screws and the surface to reduce vibration.

Test tag. (TT-50):

Must be mounted on a non-metallic support. Screw holes are provided.

LF Antennas:

Use the support to ensure correct inclination.

The connection cable provided is 5 metres long and should be cut to the required length.

Test various locations on the forklift truck to ensure best results before finally mounting the antenna.

The position may increase or decrease the range of action.

Buzzer:

As the buzzer is not IP65, it should be placed in a position protected from the inclemency of the weather.

It may be installed in the cabin area but should not be close to the driver's ears.

DC-DC Convertor:

Install close to the forklift truck battery. Wherever there is sufficient space.

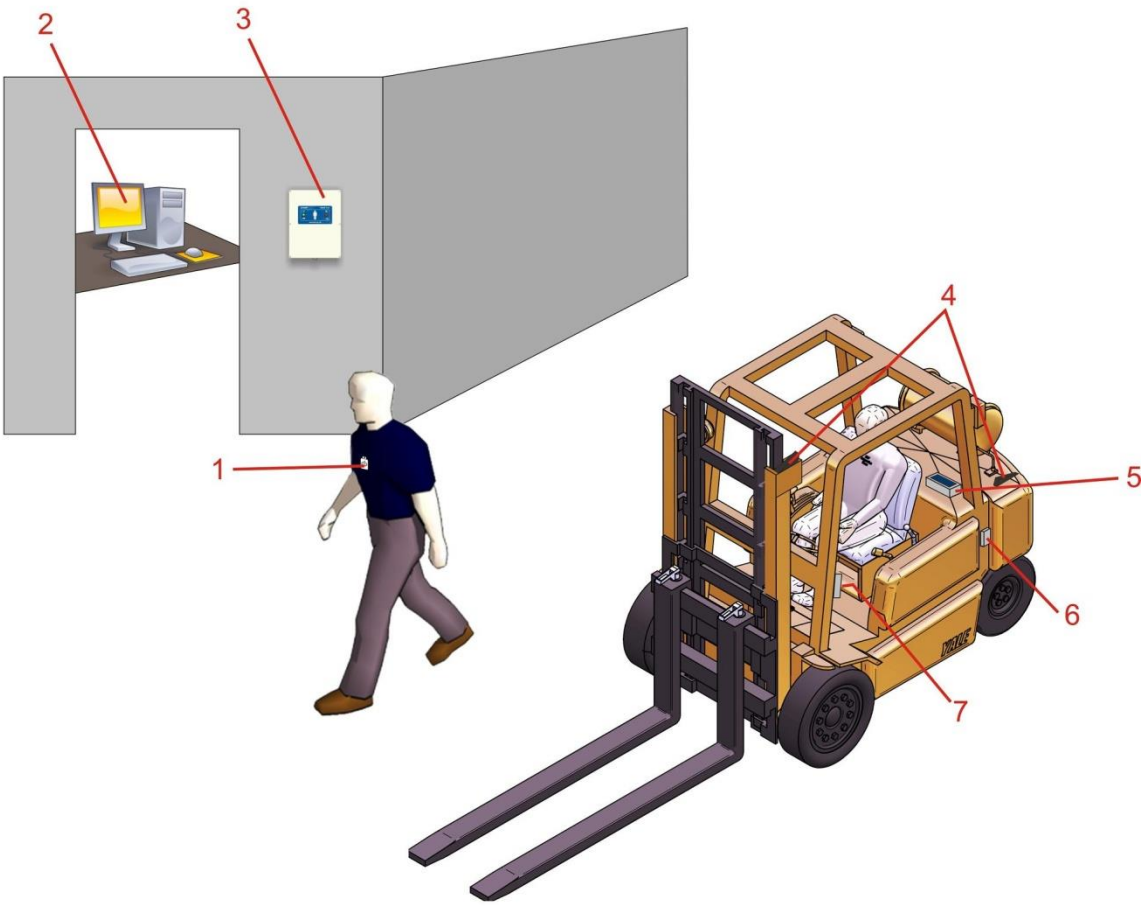
The unit operates when connected to 24V DC.

Driver cancellation system:

Should be placed within reach of the driver.

Fitted with high power adhesive.

9. INSTALLATION LAYOUT DIAGRAM



1. T-10 Tag
2. SW-10 Control software (max. distance SW-10 - AV-50: 15 metres)
3. AV-50 test antenna
4. LF Antennas (with supports)
5. AC-50 Activator
6. TT-50 Test Tag
7. T-10 Inhibitor

10. SAFETY STANDARDS

Battery service life:

- The battery service life depends on several factors.
- The Tag consumes power whenever it is in the area of influence of the activator field.
- As an example, a Tag that is used twice a day, once for the test antenna and the other for detection in the area of the activator, will have an approximate service life of 18 months.
  2 Activations /day for 3 seconds is a duration ≈ 18 months
- The batteries also depend on environmental conditions, temperature and humidity.
- When not in use, the Tag should not be stored in any area subject to extreme temperaturas

Maximum distance and conditions:

- The activator detection distance is between 0.5 metres and 6.5 metres.
- There are a series of micro switches in the activator to set the strength of the electromagnetic field generated to create the exclusion zone.
- There are several physical conditions that affect all devices that operate by Radio Frequency and which may reduce and/or alter the detection zone:
  - Environmental temperature.
  - Interference from other electronic devices.
  - Large metal structures.
  - Materials that reflect or absorb electromagnetic waves.
- When setting up the installation it is very important to see the effect of the environment where it is to be used and adjust the strength and position of the antennas so that the detection area is the same as the exclusion zone.
- Deficient location of the antenna that generates the magnetic field as well as the one communicating at a radio frequency of 2.4 GHz may reduce the effectiveness of the product.
- The LF (21 KHz) antennas should be at a minimum distance from metal structures and the RF (2.4 GHz) antenna be vertical and away from the influence of any metal structures.

For optimal operation of the PEDESTRIAN ALERT system, forklift trucks should not come close to devices that emit electromagnetic noise, especially areas where there are battery chargers or power transformers. This situation considerably reduces detection distances. This should be taken into consideration when installing the system. Once the vehicles enter areas covered by the system, it will operate perfectly.

Check the meaning of safety warnings before entering the work area.

Attention! Wear your safety transponder!

Danger! Entry to the safety area is prohibited without wearing a safety transponder.

Warning! This system is designed to increase the safety of a forklift truck. Under no circumstances should it be considered as a certified and approved personal safety system.