



Tag Exciter Installation Manual

Patient Protection

Infant Security

Asset Management

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THIS DEVICE 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 UNDESIRE OPERATION.

NOTE: THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

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Installing the Tag Exciter

Tag Exciters have three main functions. They are used to trigger an alarm at an egress point, pin point a tag's location, and/or provide a reference point for when the tag changes floors via a stairwell or elevator. The Tag Exciter transmits a 125 KHz low frequency signal (field) that is detected by the RFID tag. Detection range of the Tag Exciter is adjustable from two to 18 feet.

This section describes the two steps to installing the Tag Exciter:

- Determine the best location
- Install device.

Determine Best Location

The location of the Tag Exciter is critical to the proper operation of the system. An incorrectly placed tag exciter may cause nuisance alarms from nearby areas where tags are normally present, or fail to detect a tag when exiting through a doorway.



NOTE: Only 2 TEs may be associated with a TRC in the Argus software or with an AtGuard Controller when configuring a gate.

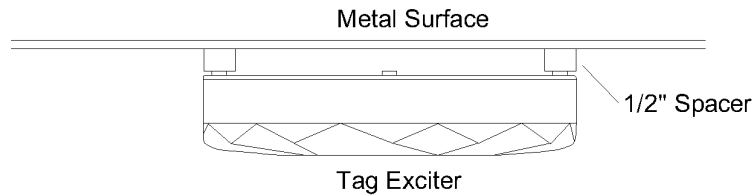
The Tag Exciter field can be visualized as a large sphere with the tag exciter in the centre of the sphere. As the Tag Exciter level is increased, so does the size of the sphere. The sphere ranges from 2 to 19 feet in diameter according to the setting.

When a tag enters the exciter field, the Tag Exciter field is detected by the tag and events are generated by this action. An event may be an exit warning or alarm.

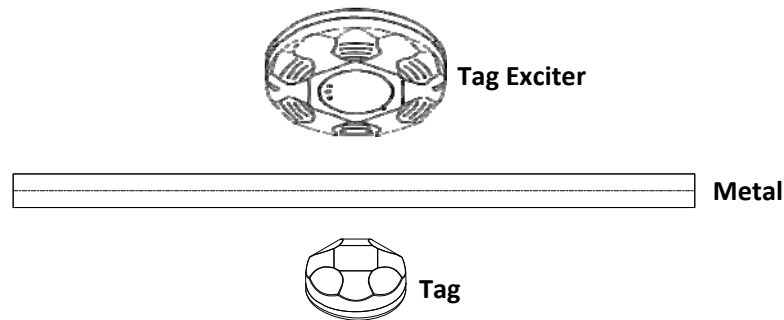
For networked applications a Tag Exciter may be used for transitioning a tag from the previous floorplan to the present floorplan when moving vertically through a building, or trigger a custom event such as direction of travel (using 2 or more tag exciters). It should be placed in a location where the exciter field is only generated in the areas where you would like the tag to be detected.

Environmental and Location Considerations

- Do not mount Tag Exciter directly on metal – such as elevator cars. Use ½ inch nylon or plastic spacers between the Tag Exciter and the metal surface. Mounting the Tag exciter directly on metal will detune the transmitting antennas.

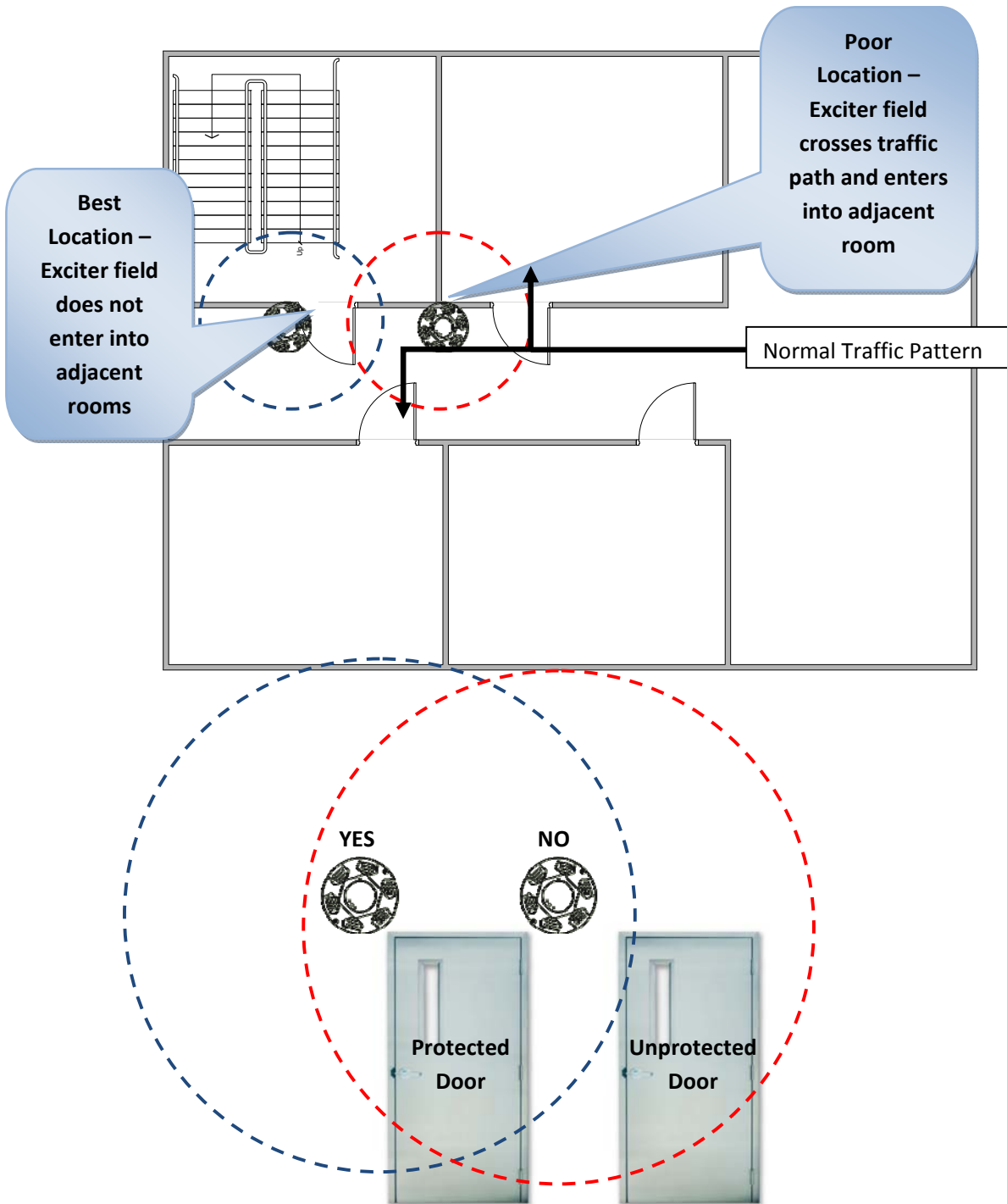


- Do not mount Tag Exciter in a location where there is metal between the Tag Exciter and the intended tag detection area such as on top of an elevator car or behind a metal door. RF does not propagate well through the metal, causing the tag to not see the exciter field.

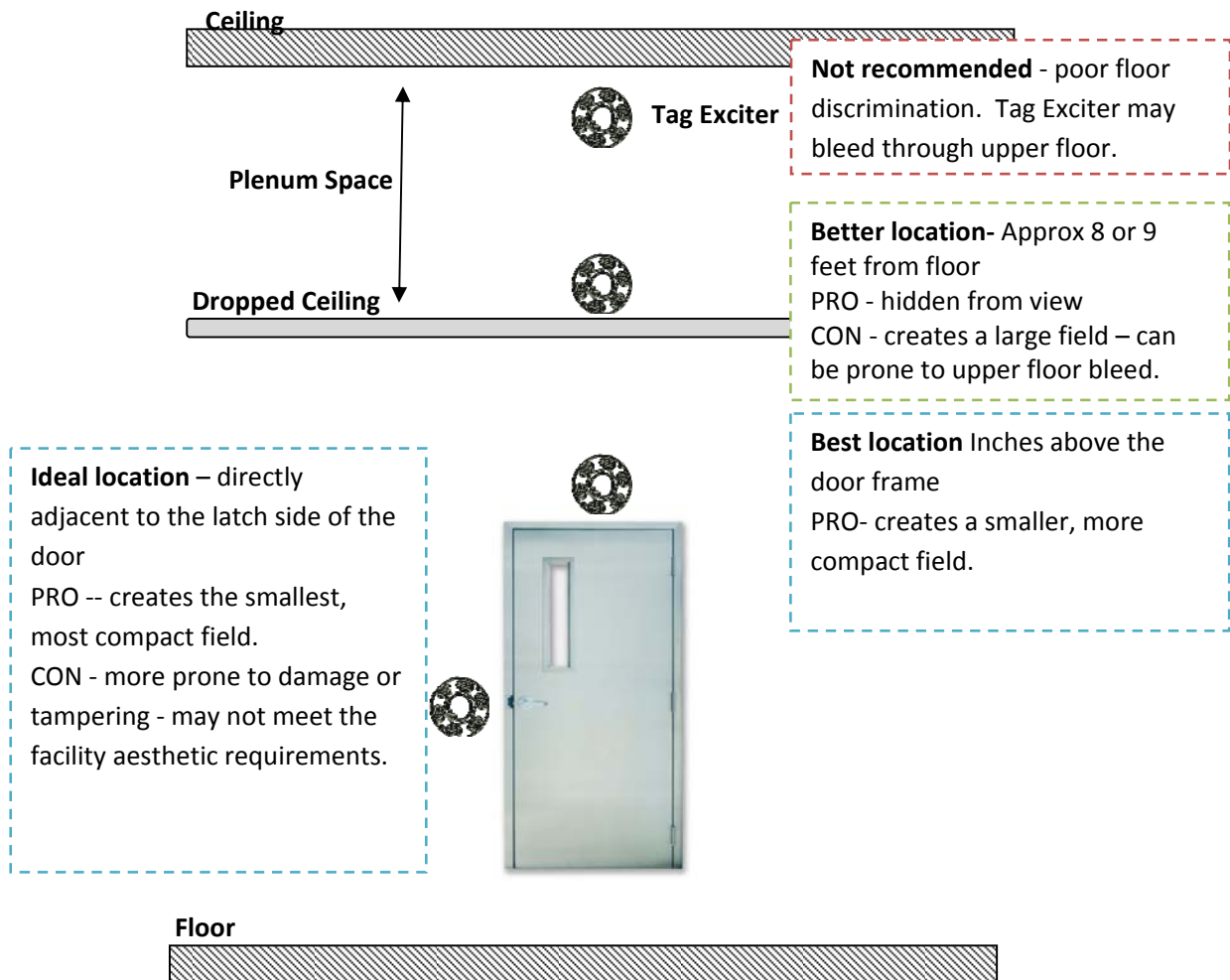


- Consider traffic patterns and legitimate/acceptable tag locations when installing the Tag Exciter.

As an example, the best location (shown below) creates a tag exciter field in direct proximity of the protected door, while at the same time maintains a suitable distance from the unprotected doors and rooms adjacent to the stairwell where tags are allowed to be located.



- Install Tag Exciter in the location that creates the smallest, most compact field.



Using Tag Exciters to Determine Direction of Travel and Room Discrimination

Two or more Tag Exciters may be used to determine direction of travel through a portal, thereby identifying precisely the location and the moment in time a tag transfers from one zone to another.

To determine direction of travel using tag exciters, you must understand how the Argus system treats zones. During software configuration, zones are defined on a floorplan by outlining the zone with a border. Adjacent zones are defined by drawing zones with adjacent borders. The Tag Exciters, identified by their serial numbers are then dragged onto the floorplan in the exact locations they are installed. In the simplest example two tag exciters are used. One tag exciter is installed in the first zone and the second Tag Exciter installed in the second zone directly adjacent to the first.

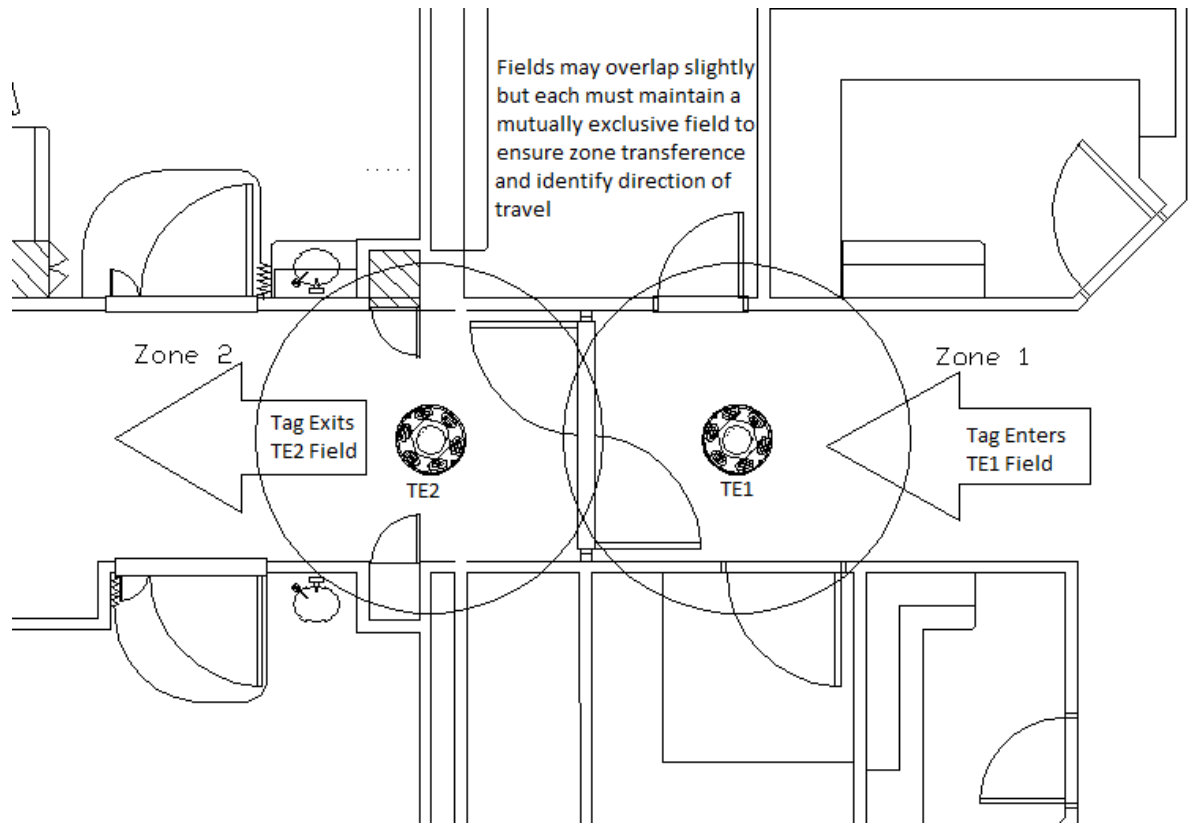
When a tag enters the first tag exciter field, its location is pinpointed at the perimeter of the first zone. As it crosses over to the second zone, the tag will be immediately pinpointed at the perimeter of the second zone at the exact time it crossed over.

Multiple tag exciters may be placed in either zone to accommodate various floorplan configurations. Keep in mind a few basic rules.

1. The tag must clearly enter a Tag Exciter field in the first zone without being in a tag exciter field located in the second zone.
2. The tag must clearly exit from a Tag Exciter field in the second zone without being in a tag exciter field located in the first zone.
3. Tag Exciter fields in either zone may overlap slightly
4. More than one Tag Exciter may be used in either zone to cover wide areas or prevent tags from slipping by undetected.

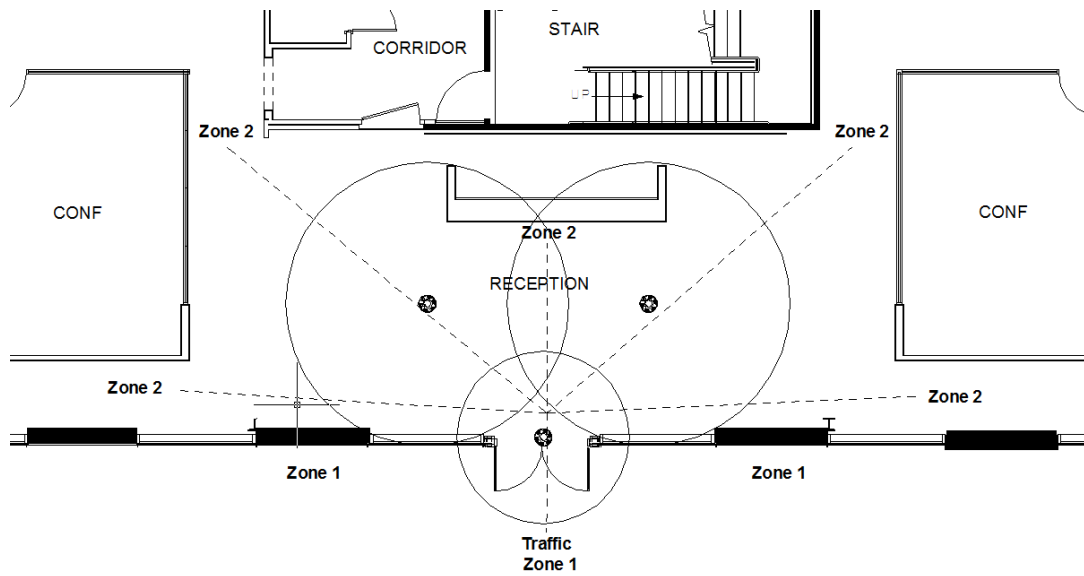
Study the examples below to determine the best tag exciter locations for your application.

Example A –determining direction of travel and zone transference in a corridor.



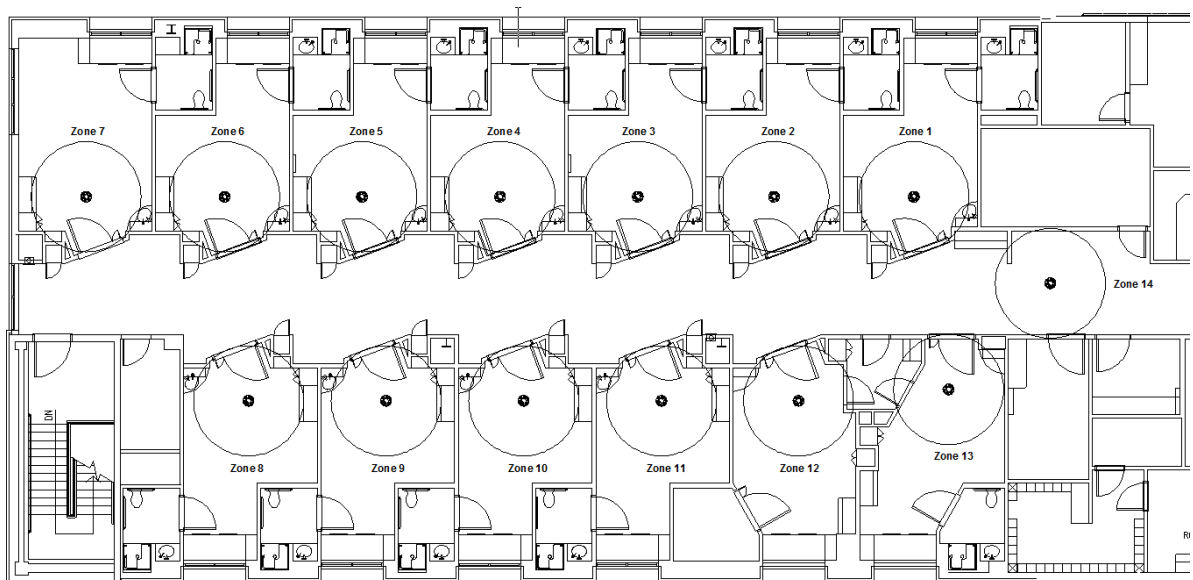
Example B Determining direction of travel and zone transference to a wide area.

Note the traffic patterns in this example. Two tag exciters tuned for a larger field are installed on one side of the doorway to capture tags as they disperse to different areas of the building. Tag Exciters are located to ensure the tag enters into one field and clearly transitions to the field(s) in the adjacent zone.



Example C Room Discrimination

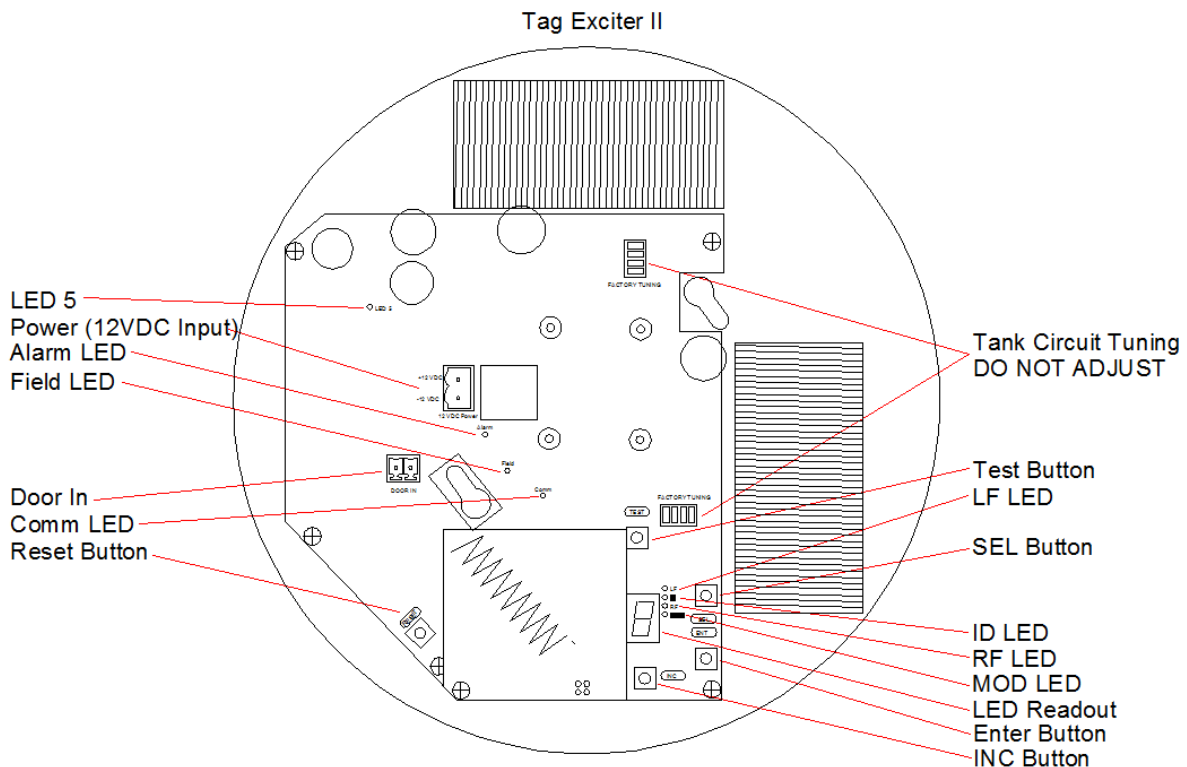
As a tag enters a zone/room the tag will remain located in that zone/room until it enters another zone/room or crosses the Tag Exciter into zone 14. Note: if a tag leaves a zone/room and does not enter another room or cross the Tag Exciter to zone 14, the system can relocate the tag in the corridor using RSSI data obtained from tag reader receivers.



Connecting the Tag Exciter

The purpose of this section is to outline the general operation and wiring of the Tag Exciter (TE). Tag Exciters have three main functions. They are used to trigger an alarm at an egress point, pin point a tag's location, and/or provide a reference point for when the tag changes floors via a stairwell or elevator. The Tag Exciter transmits a 125 KHz low frequency signal (field) that is detected by the RFID tag. Detection range of the Tag Exciter is adjustable from two to 18 feet.

Tag Exciter Inputs, Outputs, Indicators



Tag Exciter Inputs and Adjustment Points

Inputs	Description
Power (12VDC Input)	12VDC supply (11.5V Min, 14V Max)
Door In	Disables LF field when pins are shorted
Adjustments	
Reset Key	Resets TE processor, custom settings are maintained
Tank Circuit Tuning	LF Antenna tuning DO NOT ADJUST
Test Key	Feedback mode for LF field adjustments
SEL key	Selects between LF/ID/RF/MOD adjustment modes
Enter Key	press to enter value when adjusting
INC Key	increments value during adjustments

Indicators		Off	On	Flashing
LED 5	Red Power Fault LED.	Normal	Over/undervoltage	N/A
Alarm LED	Red LED, TE in undesirable condition when flashing	Normal	N/A	TE Error - Check Error code display
Field LED	Yellow LED	LF Field off	Normal - LF field on	Recalibrating field size
Comm LED	Green LED	No input voltage	Network communication established	Power on, no network communication (Normal operation for @ Guard)
LF LED	Lit when in LF adjust mode	Normal	In LF adjust mode	N/A
ID LED	Lit when in ID adjust mode	Normal	In ID adjust mode	N/A
RF LED	UHF Sensitivity Setting (Not used)	Normal	In RF adjust mode	N/A
MOD LED	Lit when adjusting MODE features	Normal	In Mode select mode	N/A
7 Seg. Readout	Numerical indicator showing status or level	Normal	Indicates current condition	N/A

Tag Exciter Power Connections

The TE input voltage is 12VDC and may be powered by a central power supply or a PoE Splitter and a PoE network switch. Note that the TE connects to the network using a 433MHz link to the TRC and does not require a TCP/IP connection. PoE Powered TEs do not use the data component of the PoE switch.



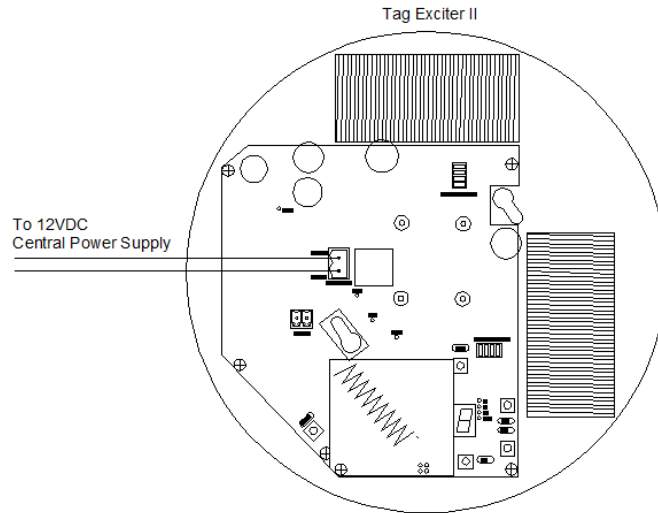
When powering the TE with a PoE Switch, ensure to use the recommended PoE Splitter (GuardRFID P/N 61-24002). PoE voltage is 48VDC from the switch and needs to be converted to 12VDC to prevent damage to the TRC.

Connect the TE to 12VDC / 1A power source either from the PoE Splitter or a 12VDC central power supply as shown below. Power supply voltage for the TE must not exceed 14VDC.

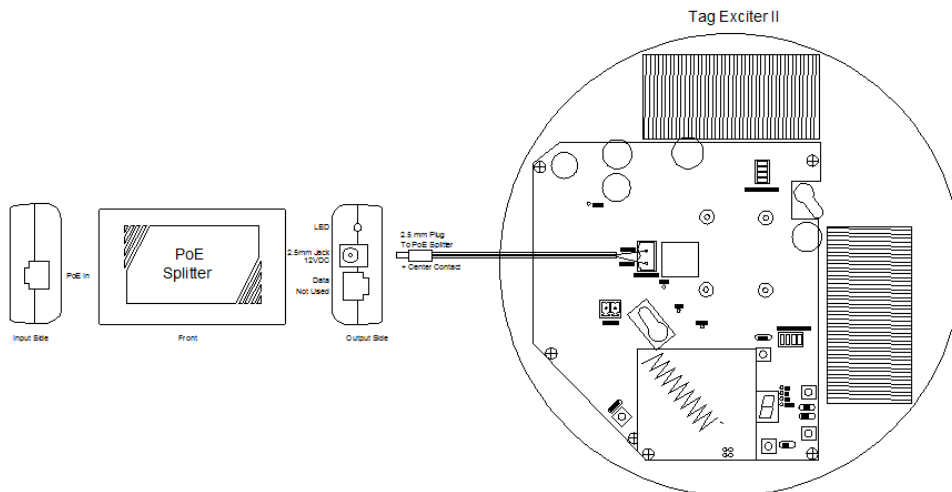
Ensuring Compliance with RFI Rules and Regulations

In order to ensure compliance with relevant RFI rules and regulations, the cable used to supply power for Tag Exciter must have ferrite suppressor attached. The ferrite suppressor is supplied with Tag Exciter and should be clamped onto the power cable as close as possible to Tag Exciter enclosure.

The part number of ferrite suppressor is BF1835, manufactured by API Delevan Inc. Any equivalent ferrite suppressor can be used.



Powering the Tag Exciter with a Central Power Supply



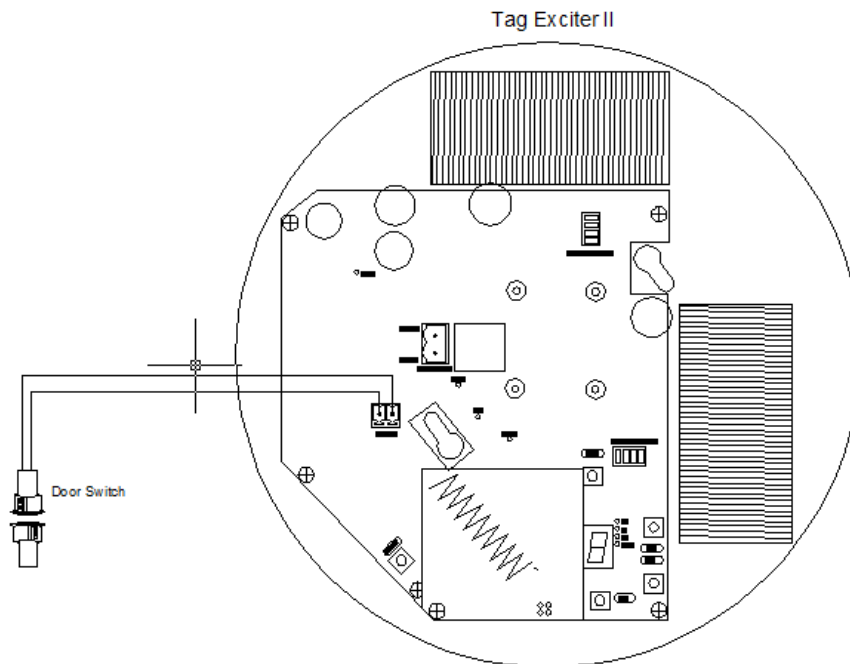
Powering the Tag Exciter with a PoE Splitter

PoE Splitter Power Connection
Striped wire to positive



Using the TE Disable (Door In)

The TE LF field can be disabled by adding a switch to the Door In input of the Tag Exciter. This feature can be used when you require the field to be switched on and off quickly. The example below illustrates connection to a N/C door switch (door closed/contact closed).



Disabling the Tag Exciter with a Door Switch

Tuning the Tag Exciter

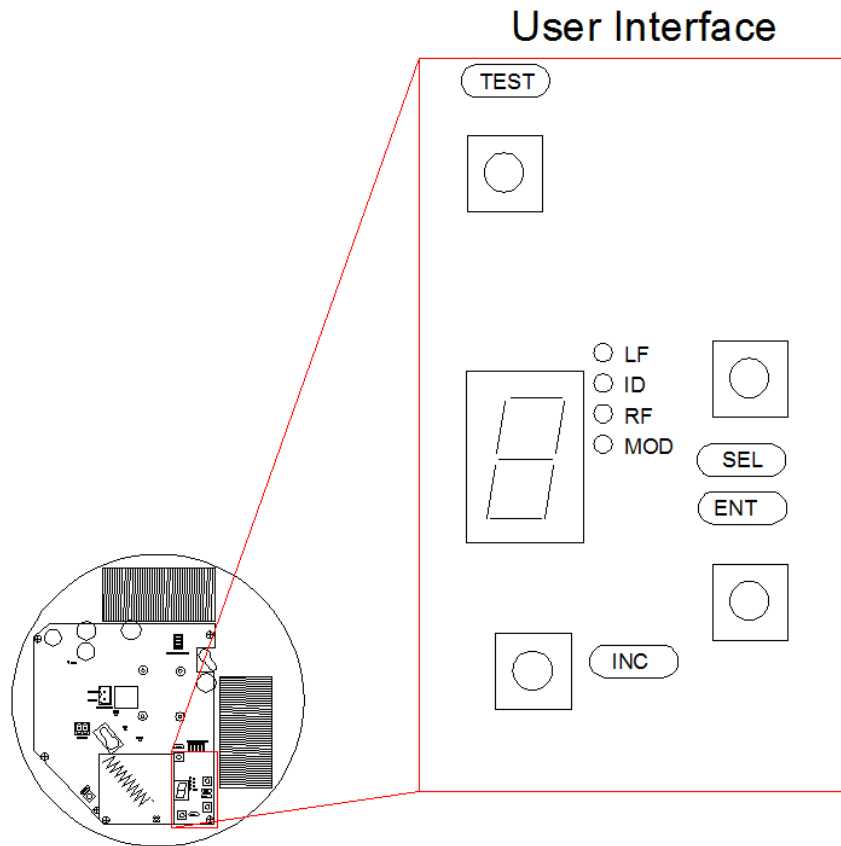
The purpose of this section is to show how to tune the Tag Exciter for optimal coverage in your application.

The Tag Exciter field can be visualized as a large sphere with the tag exciter in the centre of the sphere. As the Tag Exciter level is increased, so is the size of the sphere. The sphere ranges from 2 to 18 feet in diameter according to the setting.

Adjustments for the tag exciter include LF Field size, Changing the ID number (electronic serial number transmitted in the beacon), RF sensitivity (not field adjustable), and mode settings

User Interface

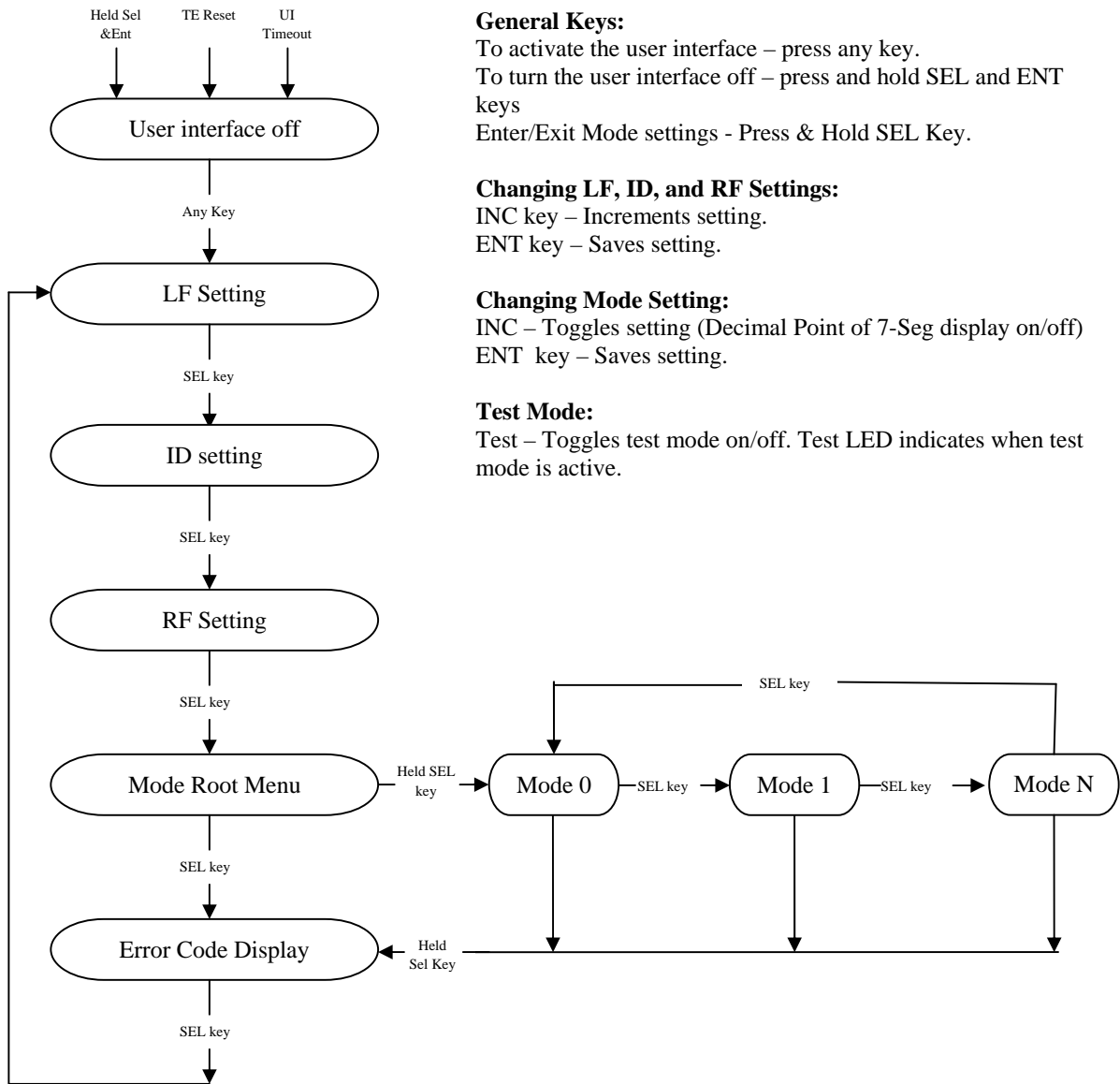
The TE User interface allows you access to the TE menu and adjustment tools.



User Interface Menu Navigation

The user interface is accessed by pressing any key. Exit the user interface by pressing and holding the SEL and ENT keys, or if there is no key presses for 10 minutes the user interface is turned off automatically.

The user interface navigation chart is shown below.



General Keys:

To activate the user interface – press any key.
 To turn the user interface off – press and hold SEL and ENT keys
 Enter/Exit Mode settings - Press & Hold SEL Key.

Changing LF, ID, and RF Settings:

INC key – Increments setting.
 ENT key – Saves setting.

Changing Mode Setting:

INC – Toggles setting (Decimal Point of 7-Seg display on/off)
 ENT key – Saves setting.

Test Mode:

Test – Toggles test mode on/off. Test LED indicates when test mode is active.

To set the LF field size

- Press any key to activate the user interface
- Observe the LF LED is lit.
- Press the INC key until the display reads the desired field size.
- Press ENT to save the selected value into TE memory

This table provides Tag Exciter current consumption and LF field size for each of 16 possible settings.		
These measurements are done under the following conditions:		
Power Supply	12.3 VDC	
Tag used:	PT1	
LF Antenna:	Tag LF antenna is oriented in parallel with one of the coils of Tag Exciter	
LF Field Settings		
Setting	Current consumption (A)	Range (feet)
0	0.06	2.0 ± 0.5
1	0.06	3.5 ± 0.5
2	0.09	5.0 ± 1
3	0.13	6.0 ± 1.5
4	0.08	7.0 ± 1.5
5	0.09	8.0 ± 2.0
6	0.11	10.0 ± 2.0
7	0.17	11.0 ± 2.0
8	0.25	12.0 ± 2.5
9	0.33	13.0 ± 2.5
A	0.42	14.0 ± 2.5
B	0.50	15.0 ± 3.0
C	0.52	16.0 ± 3.5
D	0.58	17.0 ± 3.5
E	0.68	18.0 ± 4.0
F	0.85	19.0 ± 4.0

Setting the Proper TE Field Size

There are other many uses for the TE such as pinpointing location of the tag, room discrimination or determining direction of travel. The TE field is adjusted in the same manner for all applications. Testing the TE field size and adjusting for the desired detection area is critical to proper operation of some systems. Care must be taken when adjusting the TE field size to ensure it will detect a tag exiting through a door but not exceedingly large so that it intrudes on adjoining rooms or areas where you do not want tags to be detected.

This section assumes that the TE is used at a door to detect a tag as it passes through the doorway.

To test and coarse adjust the size of the LF field

- Press the TEST key
- Holding a tag in front of you, approach the doorway with a tag at waist level, the TE will beep when the tag enters the field
- Using the LF field adjustment instructions above, adjust the TE field size to the desired level, ensuring the tag is detected every time, and does not detect tags in unwanted areas.
- Holding the tag one or two inches from the floor, approach the doorway ensuring the TE beeps when the tag passes through the doorway
- Press the TEST key to revert back to normal operation (after 10 minutes of no key presses, TEST mode is automatically turned off)

Note that the tag orientation may have an effect on the apparent size of the field. Inside the tag is a coil antenna. When this antenna is parallel to one of the coil antennas in the TE, the field appears to be larger than if the two coils are perpendicular. The variation in distance varies from one foot to four feet for larger fields. Ensure that the tag is detected in all orientations.

Test and fine adjust the size of the LF field

To perform this test and adjustment procedure, the gate must be configured in the Argus Configuration Manager, and a keypad must be associated to the gate you are testing.

- Holding a tag in front of you, with the door closed, approach the doorway with a tag at waist level, the keypad will beep when the tag enters the field
- Using the LF field adjustment instructions above, adjust the TE field size to the desired level, ensuring the tag is detected every time, and does not detect tags in unwanted areas.
- Holding the tag one or two inches from the floor, approach the doorway ensuring the keypad beeps when the tag passes through the doorway

Setting the Tag Exciter ID

Each TE is programmed with a unique ID number which is also the serial number of the TE. The TE transmits a beacon message to the TRC that contains tag in field information, Firmware revision information and the serial number. The transmitted serial number is truncated, stripping off the most significant 13 bits of the ID. Due to the most significant bits being truncated from the ID there is a possibility of two TEs to transmit the same ID. To resolve this issue, the least significant 4 bits of the TE may be changed in the field with the tag exciter ID setting.

If two TEs are transmitting duplicate IDs the least significant 4 bits of the ID number can be changed.

To change the transmitted ID

- Press any key to activate the user interface
- Press the SEL key twice, or until the ID LED is lit
- Press the INC key until the readout displays the desired least significant digit of the ID.
(i.e. 003A40 would be changed to 003A41 if the ID was changed to 1.)
- Press the SEL key to select the least significant digit
- Press the ENT key to save the selected value in TE memory

Setting the RF Sensitivity

RF sensitivity is pre-programmed during manufacture and this setting is not used.

Setting the Modes

There are three modes that are programmable, exciter field on/off, UHF board presence, and end of line resistor presence (at Door In connector). The default settings are exciter field on, UHF board present, and no end of line resistor required. These settings are not normally adjusted.

Entering MODE setting configuration

- Press any key to activate the user interface
- Press the SEL key 3 times or until the MODE LED is lit – the display will go blank
- Press and HOLD the SEL key once more until 2 beeps are heard – the display will show “0” when the key is released
- The TE is now in MODE setting configuration
- Press SEL to scroll between mode 0, 1 and 2

Setting the TE field on/off (MODE “0”)

Default – TE field ON

- Press select while in mode setting configuration until the readout reads “0”
- Press the INC key to toggle the field on and off, the field is on when the decimal point after the display is lit, off when the decimal is off (the MOD LED will flash when the setting is being adjusted)
- Press the ENT key to save the selected value in TE memory (the MOD LED will stop flashing)

Setting the TE to activate the UHF radio (MODE “1”)

Default – Radio activated – (Note: the AtGuard system does not have a radio board on the TE and will ship defaulted as “radio deactivated”)

- Press select while in mode setting configuration until the readout reads “1”
- Press the INC key to toggle activate/deactivate the radio. The radio is activated when the decimal point after the display is lit, deactivated when the decimal is off (the MOD LED will flash when the setting is being adjusted)
- Press the ENT key to save the selected value in TE memory (the MOD LED will stop flashing)

Setting the TE to detect EOL (end of line) Resistors (MODE “2”)

Default – EOL resistors not installed

- Press select while in mode setting configuration until the readout reads “2”
- Press the INC key to toggle detect/ignore EOL resistors. EOL resistors are detected when the decimal point after the display is lit, ignored when the decimal is off (the MOD LED will flash when the setting is being adjusted)
- Press the ENT key to save the selected value in TE memory (the MOD LED will stop flashing)

Reading the Error Codes

If the Alarm LED is flashing the TE has detected an error. Error codes are read from the TE display

To read the error codes

- Press any key to activate the user interface
- Press the SEL key four times, or until the ERROR LED is lit
- Read the display:

0 – No error

1 – Case open / tamper. To simulate the cover on hold your hand at the level of the cover, near the centre of the TE and the “1” error should stop. Since the case is open when troubleshooting, this error is always displayed. You must simulate the cover on to continue.

2 – Radio not detected. The radio board is faulty or not installed (Note: In the AtGuard system there is no radio board)

3 – Input power too low. Check the input voltage; it should be 12 – 13.6 VDC

4 – Input power too high. Check the input voltage; it should be 12 – 13.6 VDC