



## T-DAR® TAILGATING / PIGGYBACKING DETECTION SYSTEM

### *Installation and Operation Manual*



### **Four Head Mantrap**

T-DAR Model T4010MT

## **Warning:**

**MODIFICATION OF THE T-DAR CONTROL  
UNIT BY CUTTING OR DRILLING WILL  
VOID THE WARRANTY AND MAY REQUIRE  
REPLACEMENT.**

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## 1. INTRODUCTION

The patented T-DAR<sup>®</sup> (Tailgate Detection Alarm and Recording) system uses three-dimensional optical imaging to detect piggybacking and tailgating through mantraps, security vestibules, sally ports, or person traps. The Newton T-DAR system detects persons, differentiates them from carts or other objects inside of the mantrap, and then utilizes stereo machine vision technology to identify and tag each human within the field of view of the tracking (overhead) camera. Once the status of a passage is determined to be tailgating or piggybacking, the T-DAR system then actuates any number of possible results, all controlled and pre-selected from an easy to use user interface (UI). These alarms and signals range from flashing lights and voice annunciation through remote alarm, real-time delivery of video of the event to security, and activation of internal or existing DVR systems.

## 2. SYSTEM COMPONENTS

### ***CB410MT Control Unit***

Size: H 16 ½ in. X W 14 1/16 in. X D 6.0 in. (419 mm X 360 mm X 152 mm)

Weight: 26lbs (11.7 kg)

Enclosure: Bent steel; completely enclosed with door

Mounting: Via 4 x ¼ in. (6.35 mm) holes on back panel tabs  
(optional mounting brackets available)

Standard Operating Temperature: 40° to 90° F (5° - 43 ° C)  
(optional high and low temperature systems available)

Storage Temperature: 0° to 125° F (-18° - 52° C)



### ***S100 Annunciator***

Size: 6.00" x 8.13 in. x 7.19 in. (152 mm X 206 mm X 184 mm)

Weight: 5lbs (2.27 kg)

Enclosure: Bent steel, with high impact plastic indicator

Standard Operating Temperature: 40° to 125° F (5° - 52 ° C)  
(optional high and low temperature systems available)

Storage Temperature: 0° to 150° F (-18° - 66 ° C)



### ***DC200LP Stereo Tracking Head***

Size: 7.00 in. x 2.50 in. x 2.50 in. (178 mm X 63.5 mm X 63.5 mm)

Weight: 2.2lbs (1 kg)

Enclosure: Bent steel

Mounting: Via 4 x 1/8 in. (3.175 mm) holes on back panel tabs  
(optional mounting brackets available)

Standard Operating Temperature: 40° to 125° F (5° - 52 ° C)  
(optional high and low temperature systems available)

Storage Temperature: 0° to 150° F (-18° - 66 ° C)



*(continued)*

### ***I100 Door Position Encoder***

Size: 2.40 in. x 2.50 in. x 2.40 in. (61 mm X 64 mm X 61 mm)  
Weight: 13.5 ounces (.38 kg)  
Enclosure: Machined Delrin  
Mounting: Via 4 x ¼ in. (6.35 mm) holes on back panel (optional mounting brackets available)  
Standard Operating Temperature: 40° to 125° F (5° - 52 ° C)  
(optional high and low temperature systems available)



### ***WMK-100 Camera Head Wall Mount***

Size: Length - 2.5 in. X 26.5 in. (63.5 mm X 673.1 mm) Base Plate  
- 0.25 in. X 6.0 in. X 8.0 in. (.635 mm X 152.4 mm X 203.2 mm)  
Weight: 3.4 lbs (1.54 kg)  
Material: Aluminum sheet and extruded square tube stock, welded and powder coated  
Mounting: Wall Mounting - via 4 x 0.375 in. (9.53 mm) holes on base panel. Camera Mounting - via 4 x 1/8 in. (3.175 mm) holes on arm.



### ***MK200B Stereo Camera Drop-Ceiling Mounting Kit***

Size: 24¼ in. x 6 in. (61.6 cm X 15.24 cm)  
Weight: 2.25lbs (1.02 kg)  
Material: Bent steel  
Mounting: Once the rails are installed between the grid members of a standard acoustical tile ceiling, the camera holding plate may be moved into the best position.



### ***Stereo Camera Head Ceiling Height Extender***

A mounting kit designed to raise the camera head when the drop-ceiling height is too low. Mount the camera heads at least 8 ft. 3 in. (2.5m) from the floor.

Size: H 4.7 in. X W 14 in. X L 19 in. (119.38 mm X 355.6 mm X 482.6 mm)  
Enclosure: 12 gauge (0.080 in. / 2.032 mm) aluminum sheet riveted and powder coated  
Mounting: via 12 x 0.25 in. (6.35 mm) holes (three on each side tab).  
Camera Mounting: via 4 x 1/8 in. (3.175 mm) holes on top panel.



### 3. TIPS FOR A SUCCESSFUL T-DAR INSTALLATION

To ensure the most accurate detection, it is crucial that the final internal dimensions of a T-DAR-equipped mantrap adhere to the measurements that an end-user has provided to Newton Security. The design, performance, and price of this system are based upon those specific characteristics.

#### Mantrap Location

Locate the mantrap as far away from sunlight as possible. Changes in ambient light levels (day-to-night) in the mantrap may increase the chance of false detection and false alarms.

#### Mantrap Construction

For optimum results the mantrap should be of opaque, solid wall construction.

If a glass wall is used for the installation, Newton Security recommends:

- There should be no *indirect* sunlight in the mantrap. If the potential exists for sunlight in the environment, perform the following test with full sunlight exposure in the mantrap:
  - Turn off all lighting fixtures in the mantrap and in the surrounding area.
  - If you can read this manual in the resulting available light, there may be too much sunlight for optimum performance.
  - Point a light meter at the source of the sunlight; it should be less than 10LUX.
- Any *direct* sunlight in the mantrap will cause erratic performance and must be avoided.
- For the most consistent performance, use the least amount of glass possible, for the mantrap walls. Avoid using glass doors in the mantrap, as people standing outside the door (waiting to use the mantrap) may be detected by the T-DAR cameras.
- Avoid using fully glassed walls next to a high traffic area, as people may be detected outside the mantrap wall. When a glass wall is necessary, we suggest installing two sections of glass in the wall, running the length of the mantrap if necessary. One section may be placed higher than five feet above the floor, with the other section below three feet from the floor. The result is an opaque section, between three and five feet above the floor, that will prevent the cameras from detecting a person standing on the other side of the glass. Including a section of wall that is non-glass will also provide space for mounting access control devices.

#### Mantrap Height

- The minimum camera height for proper tracking of the T-DAR cameras is 8 ft. (2.44m). Persons taller than 6.3 ft. (1.9m) may receive higher false alarm rates in mantraps with camera heights between 8 ft. (2.44m) and 8.5 ft. (2.60m).
- For ceilings between 7.9 ft. (2.41m) and 8.5ft. (2.60m), camera height extending kits are available.
- A camera mounting above 9 ft. is recommended for low false alarm rates.

#### Mantrap Size

The mantrap size is limited by the height and viewing angle of the camera heads. The limits specified below are rigid and cannot be exceeded. Exceeding the two-head mantrap size limitations will leave a significant gap in tracking, and security. When the mantrap is built oversize, by any amount, a three or four head T-DAR system should be purchased to properly cover the area.

- The maximum length of a mantrap with cameras lower than 9 ft. (2.74m) is 9 ft. (2.74m).
- The maximum mantrap width with cameras lower than 9 ft. (2.74m) is 4.75 ft. (1.45m).
- The maximum length of a mantrap with cameras above 9 ft. (2.74m) is 10 ft. (3.00m)
- The maximum width of a mantrap with cameras above 9 ft. (2.74m) is 5 ft. (1.50m).

## Cameras

Ensure that the cameras are securely mounted and not susceptible to any movement such as:

- The opening or closing of mantrap doors, and/or
- Vibration of the drop-ceiling caused by air pressure changes within the mantrap
- Mount and align the DC200LP Stereo Camera Heads in the proper locations:
  - For camera heights below 9 ft. (2.74m), space the two camera heads no more than 4.5 ft. (1.4m) apart.
  - For camera heights below 9 ft. (2.74m), ensure there is no more than 2.25 ft. (0.70m) from each camera head (camera center) to the adjacent door or walls.
  - For camera heights above 9 ft. (2.74m), space the two camera heads no more than 5 ft. (1.5m) apart.
  - For camera heights above 9 ft. (2.74m), ensure there is no more than 2.5 ft. (0.76m) from each camera head (camera center) to the adjacent door or either wall.

## Video Cables

For optimum performance, strong video signals are required.

- For the coaxial camera cables, it is highly recommended to use compression fittings rather than crimp-on fittings. For example: Paladin-brand compression fittings are a good representative.
- Ensure that video cables are well separated from any power circuits and cables, solenoid locks, automatic door hardware, motors, and vibrations.
- All T-DAR video cable runs need to be isolated in steel conduit, not shared with other wiring.
- Cable runs must be un-interrupted, with no junction points or splices

## Floor Surface

Avoid reflective or patterned floors within a mantrap.

- Use a medium shade floor of any color. A medium shade floor will provide a good contrast for dark clothing, while masking tracking buildup on the floor.
- Install carpeted or mat flooring over hard/tiled flooring. This will reduce light reflections from the ceilings.
- Avoid installing carpet with repeating patterns or stripes
- When a tiled or wood floor is part of the mantrap, ensure that there are no highly visible, repeating seams or patterns.
- Use a material that will not show excessive dirt or tracks.
- Flooring may be of any color.

## Hardware & Finishes

Avoid reflective horizontal surfaces as may exist on door hardware, and glass frames. The T-DAR system will have degraded stereo detection near these reflective spots.

- When selecting door panic hardware for the inside of the mantrap, select hardware with a black or bronze finish. Apply a non-reflective coating on the top surface when necessary.
- Avoid large horizontal reflective surfaces on frames around glass walls and windows in the mantrap. Glass with large horizontal metal frames may reflect excessive light toward the T-DAR cameras.
- Apply a dark or non-reflective coating to horizontal, flat metal surfaces that may reflect light toward the T-DAR cameras.



## Lighting

Adequate and consistent downward lighting is required for accurate operation. To detect tailgate violations, the T-DAR requires adequate and consistent downward lighting in the mantrap. Failure to provide adequate lighting will result in increased false alarm rates or lower security.

- To provide consistent light levels across the entire mantrap, use at least one fluorescent panel per T-DAR camera head. Florescent lighting creates a more evenly lit environment and reduces bright reflections.
- If low-frequency fluorescent lighting is used, a line-lock is required.
  - If the lighting in the mantrap consists of low frequency (older, style-line frequency) fluorescents, use the AC wall-mounted transformer that is included with the T-DAR control unit to ensure proper operation of the T-DAR system.
  - This transformer, or another low voltage AC source of 6 to 30VAC, will provide the correct line locking of the T-Dar system to the building lighting.
- Newton Security highly discourages the use of direct lighting, such as can-style fixtures, or filament-style bulbs.
- If the mantrap has a tiled and/or polished floor, take care that the lighting is highly diffuse, creating no reflections to the cameras.
- The Illuminating Engineer Society of North America (IESNA) bases lighting specifications on data for *Performance of Visual Tasks*. High contrast, calls for approximately 300 to 500 LUX (30 to 50 foot-candles).
- The minimum acceptable amount of lighting for proper operation of the T-DAR system is 300LUX (30 foot-candles). Illumination must be added if the levels are below this point. Record downward light, measured approximately 40 inches, (1m) above the floor and away from the body
- The maximum acceptable amount of lighting in any area of the mantrap is 800 LUX. Record downward light, measured approximately 40 inches, (1m) above the floor and away from the body.
- If sunlight is a factor, take all light measurements after dark.

## Access Control Readers

- Avoid mounting the access reader between camera heads or in the center of the mantrap.
- The access reader should be mounted under the camera on the secure end of the mantrap.

## Power

T-DAR requires a 24VDC power supply for operation.

- An external 24V DC power supply with a peak current of 10 Amps is required.
- A power supply is NOT included with the T-DAR system.

## ***Additional Installation Tips and Known Issues***

When using an electric solenoid locks, reverse voltage diodes across the solenoid terminals must be used to reduce voltage feedback to the system.

**WARNING:** When mounting the TDAR on the wall or cabinet, ensure that there is at least six inches (150mm) between each TDAR or any other physical barrier for proper ventilation. Do not mount one T-DAR control unit with its heated exhaust directed toward the fan intake of a neighboring T-DAR control unit.

The area where the camera will be viewing needs to be very well lit. Lighting conditions cannot change over time. If lighting conditions change, the T-DAR unit must be recalibrated to accept the new lighting conditions.

Failure to supply Line lock input signal if low frequency fluorescents are utilized in the mantrap may cause erratic system operation.

## **Mantrap Operation**

Understanding the basic operation of the T-DAR mantrap will aid in a quicker installation period.

Standard Entry Procedure in a mantrap with manual doors

- In the initial reset state the secure door is locked.
- A person first enters through the public door. Depending on the mode of operation, the public door may be access controlled or be left unlocked while the secure door is closed. In a bidirectional mantrap, the T-DAR will not allow entry through the public door when the mantrap is occupied by another person or the secure door is open.
- The T-DAR scans the environment while the public door remains open. If there is a suspicious entry, the system will alarm. After an alarm, the occupant(s) must exit.
- When the public door closes after entry, a person then accesses the Secure Door, Public Side reader.
- The T-DAR scans the environment. If a single person is detected the secure door will unlock.
- If there are multiple people detected in the mantrap, the system will alarm and the secure door will remain locked. The occupants must then exit through the public door.

Standard Egress Procedure in a mantrap with manual doors

- In the initial reset state the secure door is locked.
- A person will first access the Secure Door, Secure Side reader to unlock the secure door. The public door will lock if it is not access controlled.
- Accessing the Secure Door, Secure Side reader with the mantrap occupied will not unlock the secure door. If desired, the T-DAR will generate an alarm in this case.
- After access is granted, the person will enter through the secure door, into the mantrap. Depending on the mode of operation selected, tailgate detection may occur on egress. If bidirectional tracking is turned off, the system will allow multiple people to egress through the mantrap.
- In bidirectional mode the T-DAR system will stop tailgating on egress, requiring the occupant(s) to exit the mantrap through the secure door. In bidirectional mode, with automatic scanning enabled, the T-DAR will interlock the doors after scanning for tailgating, provided the public door is not access controlled. If, in this case, the public door is access controlled, an access grant or push button will be required to open the public door. In bidirectional mode, with automatic scanning disabled, the T-DAR will require an access control grant or push button to open the public door.

## 4. BASIC INSTALLATION

### Outputs

There are various relay outputs on the T-DAR mantrap controller:

- A public door lock output relay
- A secure door lock output relay
- Three configurable outputs relays for various alarm scenarios

### Inputs

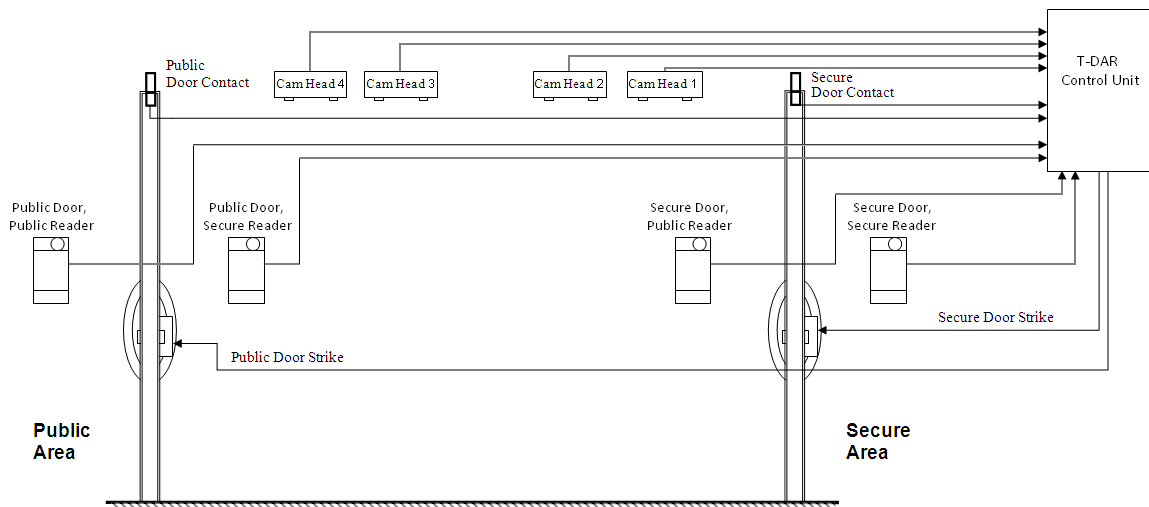
The T-DAR controller contains inputs for door closures and user interfaces

- Override input
- Two door contact switches
- Two to four valid access signals

The Secure Door, Public Valid Reader is located on the public side of the secure door. The Secure Door, Secure Reader is located on the secure side of the secure door. The Public Door, Public Reader (optional) is located on the public side of the public door. The Public Door, Secure Reader (optional) is located on the secure side of the public door.

**WARNING:** Do not mount the Secure Door, Public Valid reader in the centre of the mantrap. The reader should be mounted under the camera on the secure end of the mantrap where the tracking is the most accurate. (See the illustration below)

- All inputs terminate across a specific input terminal and ground.
- A reference voltage for all inputs is generated via a jumper between “input common” and +12VDC. The system will not operate without a reference jumper for each input.



Typical T-DAR outputs and inputs - Note the position of the Secure Door Public Reader

## ***Component Mounting***

Before any installation is begun, make sure that the proposed location provides adequate room for all electrical conduits that may be necessary. Dimensions for specific components can be found at the beginning of this manual.

## ***Local Device Placement***

- Place components such as the door position sensor, camera heads and annunciator unit within a certain linear distance of the controller to minimize the effects of voltage drop. The annunciator must be placed within 100ft (30m) of the control unit.
- For cameras, do not exceed a distance of 200 feet (60m), unless a Cable Extender/Amplifier unit is used. Information about the cost and part number of the Cable Extender/Amplifier is available from Newton Security.

## **Control Unit Placement**

The Control Unit should be located in a place that allows for access to the unit, is clean and affords the unit protection from damage or vandalism. Whenever possible, install on the secure side, outside of the mantrap, to reduce the risk of vandalism and attempts to defeat.

**WARNING:** When mounting the TDAR on the wall or cabinet, ensure that there is at least six (6) inches between each TDAR or any other physical barrier for proper ventilation.

**Special Note** - Do not mount one T-DAR control unit in a location where its heated exhaust is passed to the intake fan of a neighboring T-DAR control unit. This will lead to the rapid overheating and failure of the T-DAR ingesting the exhaust.

- The unit should be located in an area that provides an isolated 24VDC power at 10Amps.
- Mount and ground the unit in accordance with National Electrical Code (NEC) guidelines.
- The control unit should be located within an acceptable distance to the access control system so that inter-system communications and signals do not significantly diminish by voltage drop.
- Maintain adequate clearance on the sides and top of the unit to facilitate the installation of conduit. The clearance at the front of the unit should meet the requirements established for electrical panels by the National Electrical Code (NEC).
- Place the Control Unit in a location free from excessive moisture and contaminants, as environmental conditions can damage the controller.
- Use care when drilling holes in other adjacent fixtures that no metal dust or chips falls onto the T-DAR controller. The unit is equipped with mounting tabs that will accommodate ¼-inch mounting hardware.

**WARNING:** Do not modify the T-DAR control unit, by cutting or drilling. This will void the warranty and surely cause damage to the unit.

### **Stereo Tracking Head Mounting**

- Mount the camera heads directly to a ceiling utilizing the mounting tabs that accommodate up to a number 12 screw, or use a Newton MK200 ceiling mount kit designed to work in a variety of applications such as drop tile ceiling or hard ceiling.
- Take care to ensure adequate access to the connection ports on the back of the unit. Mount the stereo tracking heads in the ceiling, aligned with the center mid-line of the mantrap as shown in the diagram on the following page.
- Ensure that there are no low-mounted objects within the mantrap large enough to enable a person to hide from the view of the cameras.
- A four-head T-DAR installation of this type should be in a space no larger than 10ft by 10ft (3m x 3m).

### **Annunciator Unit Placement**

The annunciator must be placed within 100ft (30m) of the control unit. Locate the Annunciator unit within the mantrap to announce violations to the occupant as well as the persons in the secure area. The annunciator unit is fitted with conduit knockouts on the sides of the unit. Maintain adequate clearance on the sides of the unit to facilitate conduit installation. Additionally, adequate clearance is required on the front of the unit to allow for adjustment of the volume control.

### ***Stereo Camera Heads***

#### **Camera Head Placement**

Place the cameras in accordance with the diagram shown below. The camera placed on the right side of the mantrap, at the secure door will be camera one. The camera placed on the right, at the public door will be camera two. The camera placed on the left, at the secure door will be camera three and the camera placed on the left, at the public door will be camera four. Position the cameras in line with one another and perpendicular to the doors if possible. A perpendicular head placement aligns the plane of the doors, perpendicular with a line connecting the camera lenses (on a head). Space the right cameras and the left cameras a distance equal to half the width of the mantrap. Space the secure cameras and the public cameras a distance equal to half the length of the mantrap.

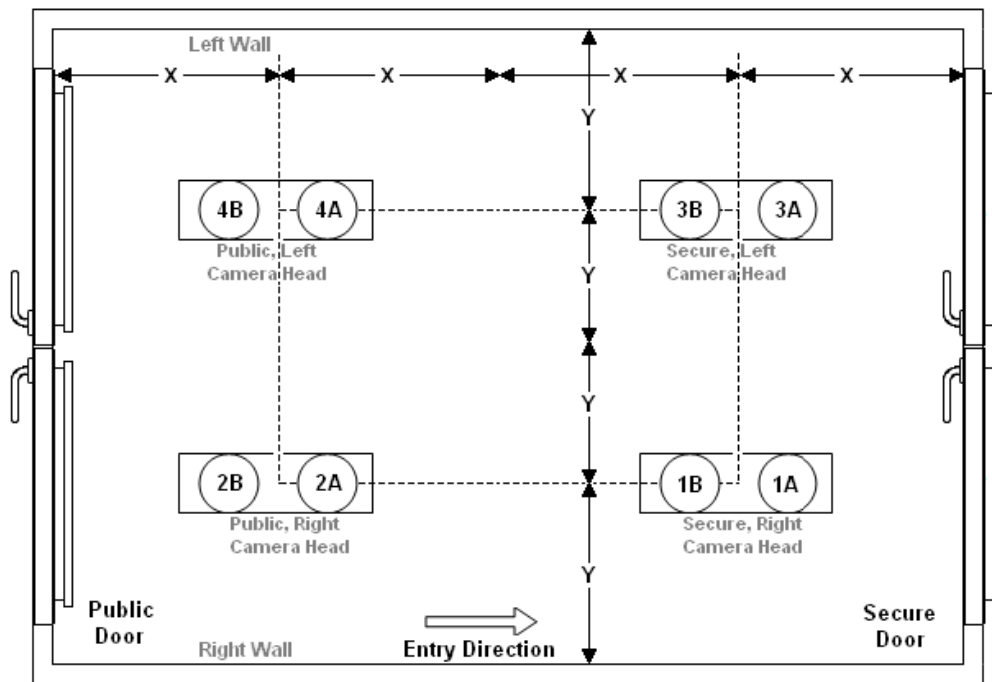
#### **Tracking Head Placement in Mantraps with Four Heads**

The placement of camera heads in a large mantrap, which requires four camera heads, will vary depending on the installation. Types of installation may include double doors for the public and/or secure portals. Some installations will have doors at opposite ends of the mantrap space (as shown below), whereas others will have a public and secure doors on the same wall of the mantrap. Any configuration can be accommodated and will require a version of software designed for the specific space. The maximum size of a mantrap using the configuration shown below and camera heights at nine feet is 10ft by 10ft (3m x 3m). For information on non-standard installation types, contact Newton Security, Inc. or your T-DAR system distributor.

#### **Distance between Cameras in a Four Head Arrangement**

A four head camera arrangement consists of four cameras in a square formation. Every camera will be designated with a number 1 – 4, after they are mounted in their final positions. After camera placement is finished, all measurements should be taken relative to camera one. In the four head arrangement, camera one will be located closest to the secure side of the mantrap and usually on the right side as one enters through the mantrap.

## Camera Head Placement



*A typical mantrap - top view*

When recording distances, measure from the center point of the camera head (between two lenses). Note that two camera heads may never be more than 5ft (1524mm) apart and the distance from the wall (or door) cannot be more than 2.5ft (762mm). Ensure that each camera head is level and positioned square to the surrounding camera heads. The figure above shows a basic four head arrangement comprising a four head mantrap.

### **Cabling**

For each Camera Head:

- Run two video coaxial cables (75 Ohm) with BNC connectors.
- Run a single CAT-6 (Ethernet) cable.

### **Annunciator Connection**

Connect the annunciator to the T-DAR control unit using a CAT-6 cable. Plug the RJ45 into the "Annunc1" port of the T-DAR controller. The annunciator must be mounted within 100ft (30m) of the control unit.

### **Cable Terminations**

For each Camera Head, install and terminate two video coaxial cables (75 Ohm) with BNC connectors. Use compression crimps on both ends of the coaxial cables.

- Label the cables on both ends, so that cameras A and B are easily distinguishable, near the T-DAR controller.
- Label the cables on both ends, so that cameras one through four are easily distinguishable, near the T-DAR controller. On the face of each camera head, the labels "Camera 1" and "Camera 2" correspond to camera connections "A" and "B" respectively.

- For all four camera heads, install and terminate a CAT-6 cable (straight through) from each camera head to the T-DAR control box.
- The locations of each camera head will determine the camera number and where it plugs in. After placing the camera heads in the ceiling, record their serial numbers so the individual calibrations can be loaded into the T-DAR controller (via the user interface). Keep the calibration CD's located in packaging for each camera.
- Camera head 1 and head 2 CAT-6 cables connect to the "Camera 1" and "Camera 2" RJ45 ports.
- Camera head 3 and head 4 CAT-6 cables connect to the "Event Cam 1" and "Event Cam 2" RJ45 ports.
- Camera head 1a and head 1b coax cables connect to the "Camera 1a" and "Camera 2b" BNC ports.
- Camera head 2a and head 2b coax cables connect to the "Camera 2a" and "Camera 2b" BNC ports.
- Camera head 3a and head 3b coax cables connect to the "Camera 3a" and "Camera 3b" BNC ports.
- Camera head 4a and head 4b coax cables connect to the "Camera 4a" and "Camera 4b" BNC ports on the A400, four head adaptor box (shown below).
- The A400 plugs in to the Cat5 port labeled N/C at the top of the control unit. This adaptor provides video to the T-DAR control unit for camera four.



## 5. Modes of Operation

### ***Bi-Directional Mantrap***

A bidirectional mantrap may utilize the same access control hardware as a standard mantrap: generally speaking, door locks, door contacts, readers, and T-DAR system.

Depending on the installation type, there are three optional methods of egress in a bidirectional mantrap. The first method of egress requires a valid access read on the inside of the mantrap, while the second method of egress does not require a valid access on the inside reader. When no valid access is required on the inside of the mantrap, the system will scan automatically after the secure door closes. When a valid access is required on the inside of the mantrap, the system will scan after the valid access read. The override procedure in a bi-directional mantrap is the same as the override procedure in a uni-directional mantrap.

### ***Automatic Door Control Mantrap***

The T-DAR can provide outputs for automatic door control. The outputs consist of a dry contact relay closures. The relay closures are momentary one second closures. The closure may be normally open or normally closed, for each door.

With the automatic door function enabled, the T-DAR will require at least three access devices. An access control device will be located on each side of the secure door. The secure door will open after receiving a pulse from the T-DAR unit. There must be at least one access device on the public side of the public door to open the public door. If there is no access button on the secure side of the public door, then the access reader in the mantrap must be used to open the public door during egress.

### ***Number of Access Control Devices***

The mantrap may contain two, three, or four access control devices, depending on the desired mode of operation. In this manual, the reader positions will be designated as secure door/secure reader, secure door/public reader, public door/secure reader, and public door/public reader. The public door/secure reader will normally be a button.

#### **Option 1 – Two access control devices**

Two access control devices may be utilized on the mantrap. In this scenario, the public door is not access controlled by T-DAR (public door access control may be provided by an alternate system). One access control device will be located on each side of the secure door. The access control device on the outside of the mantrap (secure door) will only allow access to the mantrap when the public door is closed and the mantrap is empty.

#### **Option 2 – Three access control devices**

Three access control devices may be utilized on the mantrap. The two possible internal access control devices are combined in this mode of operation; a single access control reader will be used for entry and for egress. In this scenario, the public door has controlled access with only one access device on the public door (outside the mantrap). In addition, there are two access control devices on each side of the secure door. The two access control devices on the outside of the mantrap (each door) will allow access to the mantrap when both doors are closed and the mantrap is empty.

The access reader on the inside of secure door will unlock the public door during egress. The public door will only unlock during egress if there is one person in the mantrap or the system is set as



unidirectional (no detection on egress). The internal reader (public side of the secure door) will unlock the secure door, as long as one person is detected in the mantrap and the public door is closed.

### **Option 3 – Four access control devices**

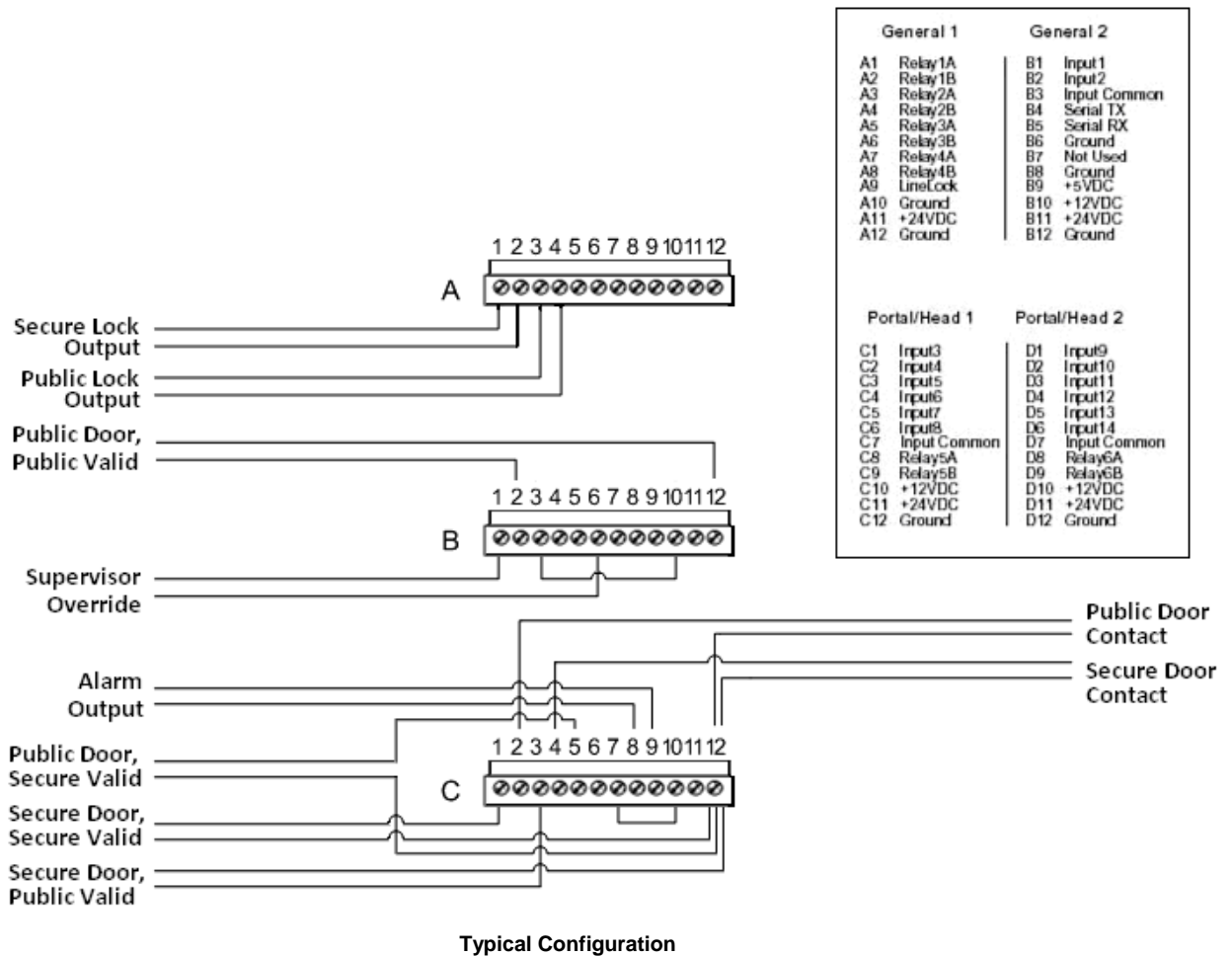
Four access control devices may be utilized on the mantrap. The two internal access control devices are separated in this mode of operation; one device for entry and the other device (usually a button) for egress. In this scenario, the public door has controlled access with an access control device on each side of the door. In addition, there are two access control devices on each side of the secure door. The access control devices on the outside of the mantrap (each door) will allow access to the mantrap when the doors are closed and the mantrap is empty.

There will be a button on the inside of the public door, which will unlock the public door during egress. The public door button will only unlock the public door if there is one person in the mantrap or the system is set as unidirectional (no detection on egress). The reader on the public side of the secure door will unlock the secure door, as long as one person is detected in the mantrap and the public door is closed.

## 6. INTEGRATION WITH THE ACCESS CONTROL SYSTEM

### Relay Output Connections

The T-DAR T-2010 control unit is equipped with four relays on the General 1 connector, plus one relay on each of the portal connectors. Use these relays to signal various alarm conditions based on user configurable options in the user interface. Relay outputs have no polarity and are dry, providing no voltage. Various degrees of customization are possible through coordination with Newton Security. The output relays are single pole/single throw, and normally open.

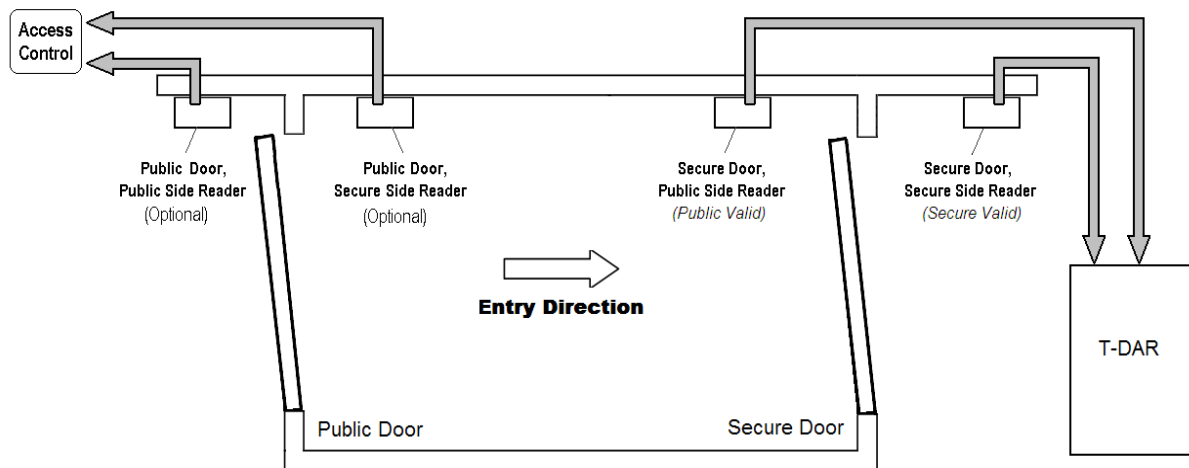


**Notes:**

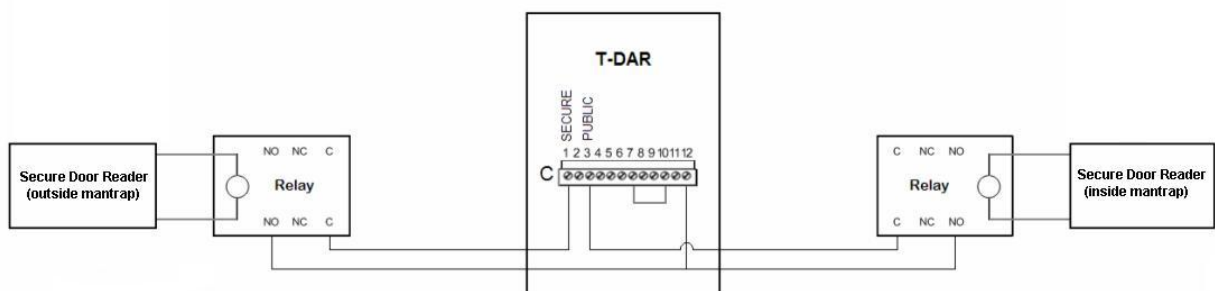
- There is no option for setting the relay outputs to normally closed.
- All input grounds are common
- A jumper between +12VDC and common generates a reference voltage for all inputs

## Access Readers - Public and Secure Doors

Each valid access grant switch must be electrically isolated from the access control system to allow for proper operation. This will typically require the installation of a double pole/double throw relay that provides an output to the T-DAR system. This is necessary to ensure that there is no noticeable latency in the receipt of a valid access grant signal by T-DAR. Failure to use isolated circuits or using access control system auxiliary outputs/relays to simulate valid access switch activity may result in poor system performance.



### Public and Secure Valid Access Connections



## Door Lock Control

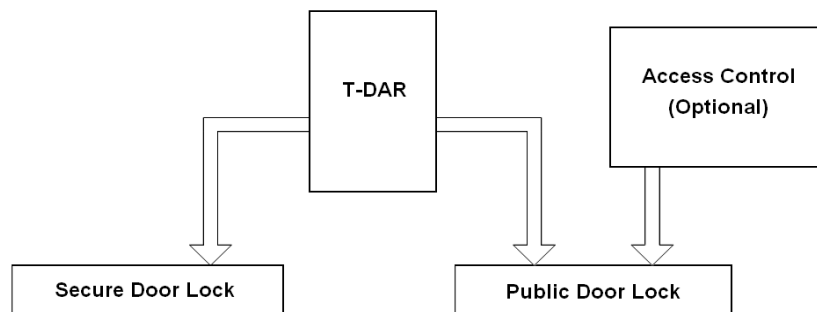
Two relays on the T-DAR unit control locking of mantrap doors. These relays are normally open and will close (engage) to lock, each door. **Relay Closed = Door Locked.** The normally open status of these relays is not switch-able. The T-DAR locking relays terminate at 1a/1b and 2a/2b on the “A” Phoenix connector. When either the public or secure relay outputs close (engage), the corresponding door should lock. There are two options for mantrap door control, explained below.

**Note:** If power to the T-DAR unit is lost, all T-DAR relays will open, potentially unlocking the doors (this is dependent on the door lock integration).

### Option 1 (Dual control of the public door)

When controlling the public door lock by a separate access control system (adjacent to T-DAR), the access control system should maintain control of the public door lock, even when powering down the T-DAR unit. Alternatively, the T-DAR unit should be able to keep the public door locked, regardless of the state of the access control. The diagram below shows a single T-DAR unit controlling the public and secure door locks. The public door will lock only when the T-DAR unit AND/OR the access control system sends a lock signal. In other words, *neither* system should have the ability to open the public door alone.

**Note:** The T-DAR controller does not lock the public door when the mantrap is not in use. For this reason, the end user may want to add a reader (and access control) to the public door.



### Option 2 (Stand Alone T-DAR Mantrap)

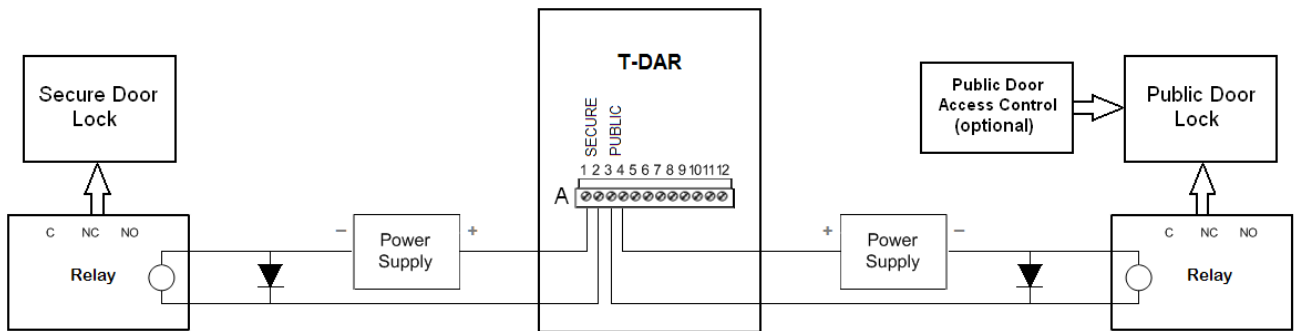
The T-DAR mantrap system may operate independent of an access control system. In this installation, the T-DAR controller will control both, public and secure door locks without access control on the public door. The T-DAR software will perform precisely the same as in Option 1, maintaining door control and all other functionality. When the T-DAR unit controls the public door solely, it will keep it unlocked until the secure door is open (or unlocked). In situations where power is lost to the T-DAR unit, the doors will be unlocked unless there is a failsafe system to keep the doors secured.

**Note:** in this option, the mantrap will only have one door locked at a time. As in Option 1, both doors cannot open at the same time.

### Protecting T-DAR from Door Lock Feedback

Use external relays to isolate the T-DAR from door locking voltage feedback. Use diodes across the solenoid terminals of the external relays to reduce voltage feedback to the T-DAR (shown below). Power for the T-DAR controller should be isolated from door locks or any motorized door hardware. The T-DAR controller requires 24VDC at 8amps.

**WARNING:** Failure to use external relays with the Chexit, or similar solenoid locks, can damage the T-DAR control box.



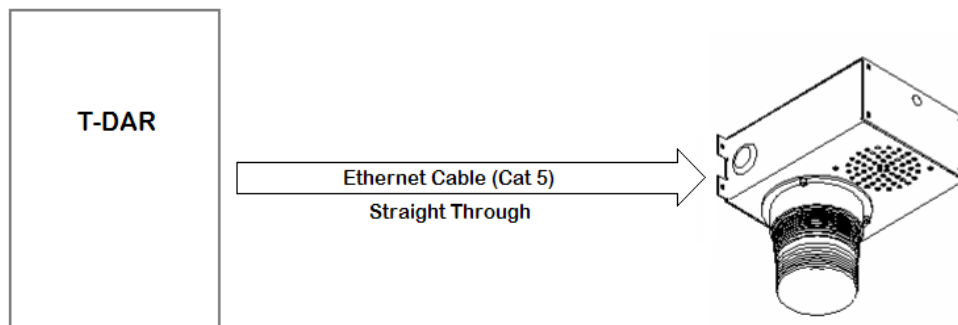
**Note:** there is no polarity on the T-DAR output relays.

### Annunciator Unit

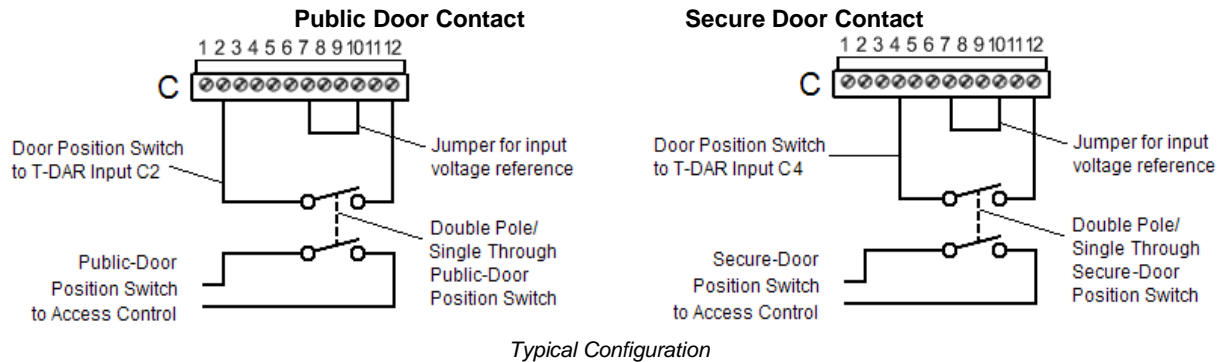
Place the annunciator inside the mantrap to notify the occupant(s) of a violation.

- The annunciator must be mounted within 100ft (30m) of the control unit.
- Adjust the volume on the annunciator so that the instructions may be clearly heard. The volume knob is located on the top of the unit, under the black plastic plug.
- Install and terminate one Ethernet cable (straight through) on the annunciator, leading directly to the 'Annunc 1' connector on the T-DAR control unit.
- T-DAR mantraps use one annunciator, so the 'Annunc 2' is not used.
- If the annunciator is not activating, or is not playing the proper recordings, use the test buttons on the "Advanced" tab to test the functionality.
- If the strobe and/or voices do not play using the test buttons, check the CAT-6 cable using a network cable tester, (unplug the cable from the T-DAR before testing).

**WARNING:** plugging in a camera head (CAT-6 cable) into an annunciator port or using a crossover cable to connect a camera, may damage the control unit or camera head.



## Door Contact Switch



The door contact switch must be independent of the access control system to allow for proper operation. This will typically require the installation of a double pole/double throw door switch, or the addition of a second door contact.

**WARNING:** Failure to use isolated circuits, or using access control system outputs/relays to simulate door contact activity, can result in poor system performance.

- There can be no noticeable latency in the receipt of door switch signals by T-DAR.
- The door position switch will connect to the Portal Contact terminal and to either ground or +12v (or applicable source voltage) dependent upon installation type.
- Ensure that the distance from the control unit to the door position switch is less than 200 ft. (60m). Contact Newton Security for guidance on longer distances.
- A jumper between +12VDC and common determines the reference voltage for all inputs.
- All input grounds are common.

## Supervisor Override

The supervisor override is a T-DAR input that allows multiple persons and objects to pass through the mantrap without alarming or preventing passage.

- While holding the override signal, the strobe will continue to flash on the Annunciator.
- With supervisor override enabled, or disabled, the T-DAR will not allow both doors to be open at the same time.
- Providing a supervisor override signal (alone) to T-DAR, does not open or unlock the public or secure doors.
- For passage through the mantrap using supervisor override, the Secure Door, Public Side reader must be validated while both doors are closed.
- If the end user requires that both doors open at the same time (e.g. during an emergency), external wiring and programming may be used to disable the T-DAR lock output (for doors).
- Supervisor override is input 1 on the T-DAR control box, which corresponds to B1 on the front T-DAR panel.

### **Operating the Supervisor Override Switch**

The supervisor override signal may be a brief signal or a continuous signal.

- To stop presently running Annunciator alarms and put the mantrap in a reset state; send a momentary override signal to the T-DAR controller.
- Releasing the override signal allows the T-DAR unit to alarm on the next violation.
- Pressing the supervisor override switch continuously will halt all Annunciator statements until the override signal ceases. The alarm will continue to flash with supervisor override enabled.
- With an active override signal and both doors closed, any valid access signal to T-DAR will unlock the secure door.

## 7. INSTALLING SOFTWARE

The T-DAR Software CD-ROM contains an installer for the user interface application and a loader program for the T-DAR Control Unit. These applications are contained on disks included with the T-DAR system. The Control Unit software is preloaded in the T-DAR control unit upon shipment. The included Control Unit install disk is only required for backup purposes.

### *User Interface*

There should be only one Newton Security user interface installed on a computer at any time. If you are having trouble running T-DAR software, it may be a result of version conflicts with previously installed T-DAR software. If a version conflict is suspected, uninstall all existing versions of T-DAR software and then reinstall the version you require.

Before removing existing Newton Security software, be sure that you have access to the installer files of this software. Before removing installed software, save the settings of the mantraps that you have access to. After uninstalling all Newton Security software, be sure that there are no Newton Security directories left in the program files on the host computer.

Future setup personnel may require the user interface and control unit software. Before removing software, make a record of the user interface version and control box version of each mantrap. Store these records for the T-DAR systems in an easily accessible location, on your computer and (if possible) next to each T-DAR control unit.

### **Installing the User Interface**

1. Insert the T-DAR Software CD-ROM into the host PC.
2. Browse to the CD-ROM drive and execute setup.exe.
3. Follow the on-screen instructions.
4. After the software is loaded, launch the UI from the start menu on the host computer.

### **Connection to Computer**

#### **Configuring the Host TCP/IP Connection**

1. The factory-set TCP/IP connection on the host computer is typically set to “automatic”. Changing these settings will establish a connection to the Newton Security Inc. T-DAR, but may disconnect or even conflict with your current network system. Please check with your network administrator if you have any questions.
2. From the desktop right click “My Network Places” and select “Properties”. In the window that opens, select “Local Area Connection” and click “Properties” from the new selection. A new window will open, select “Internet Protocol” (TCP-IP) and click its “Properties”.
3. You will see a selection box labeled “Use Following IP Address, select this option.
4. Enter the following information according to the IP on the T-DAR door:  
**IP: 10.3.10.x (use a number, one higher; if x is 51, use 52)**  
**Subnet: 255.0.0.0**  
**Gateway 10.0.0.1 (this may be left blank)**



(continued)

5. Apply these changes and return to the desktop. You may have to reboot your host computer before the changes take effect.
6. Connect the T-DAR to the host computer using an Ethernet cable. A crossover cable may be required when connecting directly. Ensure that LED 2 on the front of the control displays a green light. If there is no green light, there is no connection.
7. Ping the unit by typing, "ping -t" followed by the IP address of the control unit (the IP address is labeled on the inside of the door of the T-DAR control unit). If the IP address is: "10.3.10.51", type: "ping -t 10.3.10.51". You should see: "Reply..."

### Connecting via the User Interface

1. Select Connection then Configure Connection from the menu bar.
2. Enter the pre-configured IP address in the IP address field. If the IP address of the control unit has changed from its original value, then enter the latest address. The serial number and factory-set IP address of each vision system is on the inside lower corner of the door of the control unit.
3. Select Connection then Connect from the menu bar.
4. A connection via Ethernet becomes established. If no connection results, see the troubleshooting portion of this manual.

**Note:** If the IP address of the vision system is changed, the information printed on the control unit will no longer be valid.

*An illustration of the Configure Connection screen is on the following page.*



### Upgrading the T-DAR Control Box Application

1. Connect to the T-DAR Control Unit using an Ethernet cable and ensure you can ping the T-DAR unit.
2. Insert the T-DAR Software CD-ROM into the host PC and locate the control box directory, designated by "cb".
3. Execute update.exe.
4. When prompted, enter the IP address of the control box. Locate the IP address on the inside of the door of the control unit. If the IP address of the control unit has changed, enter the latest address.
5. Follow the on-screen instructions.

**Note:** the T-DAR controller is shipped with the control box application preinstalled

## 8. CONFIGURATION AND SETUP OF T-DAR SOFTWARE

### ***Components Needed For Setup:***

- A computer running the T-DAR user interface software
- A video monitor or television with associated cabling
- The camera calibration CD's that came with the system
- An Ethernet cable, straight or crossover

### ***Connect and Verify Camera Functionality***

1. Connect to the T-DAR controller using the IP address located on the inside of the controller door. The lower left corner of the user interface displays the connection status.
2. On the monitor tab in the user interface, change the Display Demo to 'Show camera views'. View the public door camera head by selecting 'Public Door' from the drop-down menu.
3. Observe the bottom two video images on the monitor. If any video signals are missing, or if any of the signals are rolling or visually "noisy", refer to the troubleshooting section for assistance.
4. Change to the secure door camera head using the drop-down menu and repeat step three.

### ***Configuring the T-DAR System***

Use the T-DAR user interface (UI) to setup and optimize the performance of the system. The following instructions provide guidelines that enable the installer to place the T-DAR system into service.

#### **Viewing Images**

The installer should select the Show Camera Views view from the monitor page. This will show a "four image" display on the CCTV monitor showing the tracking image, event camera video, and tracking camera views 'a' (1) and 'b' (2) from a single camera head. Camera head 'b' (2) and head 'a' (1) are visible on the bottom, left and right respectively. Event video capability does not exist on three and four head T-DAR mantraps. Using this image, the installer is able see what the system is viewing in real time. From the drop-down menu, there is an option of displaying images from the secure door or the public door.

#### **Calibration**

After installing the T-DAR unit and connecting the UI, calibrate the mantrap.

- The purpose of the calibration is to "teach" the system what the environment looks like when the area is empty of people.
- The secure camera head (camera 1) and the public camera head (camera 2) will both need a separate calibration.
- Remove objects that are not normally in the scene, such as carts, parcels, tools, etc. during calibration.

This base calibration will then allow the system to recognize objects introduced into the scene and track them, while ignoring objects that are normal to the scene.

## Testing the Units

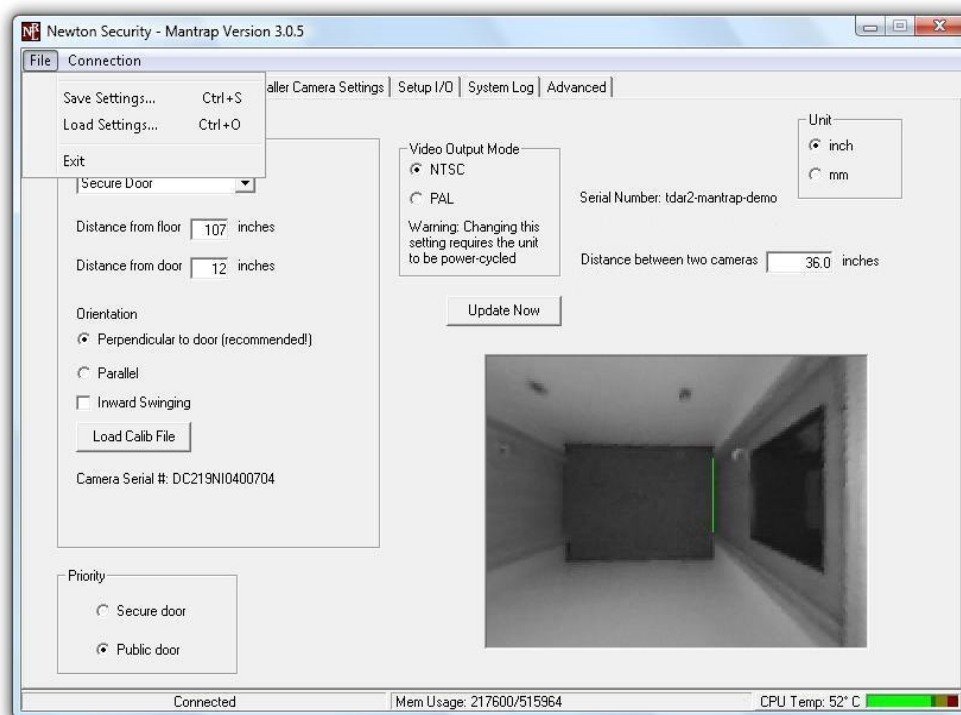
Test the units periodically to ensure that they are well-calibrated and functioning properly. Accomplished this by having two people walk into the mantrap through the public door. With two people passing through the public door, a local and remote alarm should generate. The recorded annunciator spoken warning should say, “Only one person at a time allowed through door”. If the system does not operate correctly, see the troubleshooting section of this manual. If the system still does not operate correctly, call Newton Security or your integrator for additional support.

## About T-Dar User Interface Software

The T-DAR User Interface (UI) software consists of seven tabbed pages labeled as follows; Initial Set-up, Monitor, Installer I/O, Installer Camera Settings, Setup I/O, System Log, and Advanced. One navigates the UI by a series of tabs and menus. The tabs control the configuration, setup and monitoring of the system. The menus contain options for configuring connections, saving/loading settings, and performing advanced changes to the system.

### File Menu

Selecting File from the menu opens a window that allows options for saving and restoring settings. Copy and store these settings in a safe location. In the event of having to restore the software, recall any configuration settings by loading the settings file from the file menu.



### Save Settings

The Save Settings option stores all the user configurable settings for system back up. This file has the “.nlic” file extension. Save this file to the computer designated to be the main host for the User

Interface. A copy of multiple T-DAR system settings files should be stored and maintained centrally. Create user-defined logical names for the file, such as “East Mantrap.nlc” to avoid confusion.

### Load Settings

Use Load Settings to perform a system restore from the file saved by using the Save Settings feature. A window will open asking the operator to specify the file location for this unit’s settings. Choose the location of the desired file to load from and click OK

### Exit

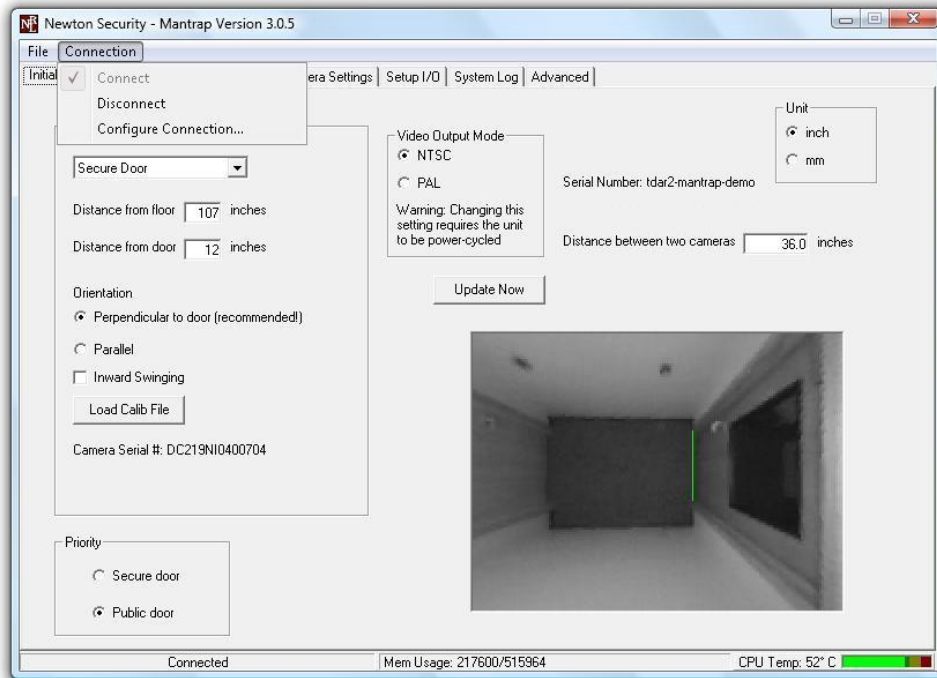
Clicking the Exit button closes the User Interface. The T-DAR will continue operate, even with the user interface disabled. Adjusted settings will persist on the T-DAR control unit after disconnecting. The T-DAR control unit does not require a connection with the host computer under normal operation.

**Note:** The “Save Settings” and “Update Now” commands do not save (or send) settings to the T-DAR control unit.

## Connection Menu

### Connection

Connect establishes communication between the UI application and the T-DAR hardware. You must establish a connection before performing UI operations. With the T-DAR IP configured, selecting Connect from the menu will enable the User Interface. Once enabled, you may calibrate or adjust the settings as necessary.



## Disconnect

Disconnect may be used to close the connection with the T-DAR unit and disable the User Interface. Find the connection status on the left of the bottom status bar. Use the Disconnect command as the first step in closing an Ethernet connection.

**Note:** Failure to close a connection in this manner will require a reboot before reconnecting.

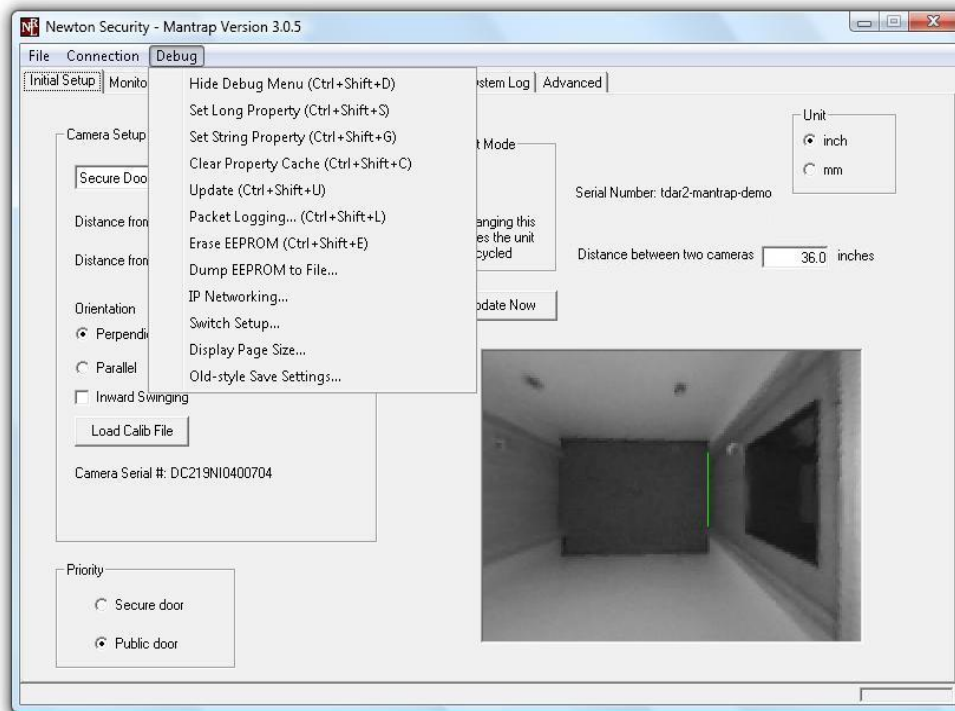
## Configure Connection

This selection allows you to change how the computer connects to the T-DAR control unit. You must connect the User Interface via addressable IP. Always Connect on Start Up is a separate option.

## Debug Menu

The Debug menu is a normally hidden menu item showing some advanced features. Press CNTR+SHFT+D to display. The Debug menu is not for general use, but designed for use by the system administrator to troubleshoot or make changes to the system. Without proper training, seek assistance before making changes using this menu.

**WARNING:** Making improper changes to the Debug Menu may result in unexpected behavior.



## Elements of the Debug Menu

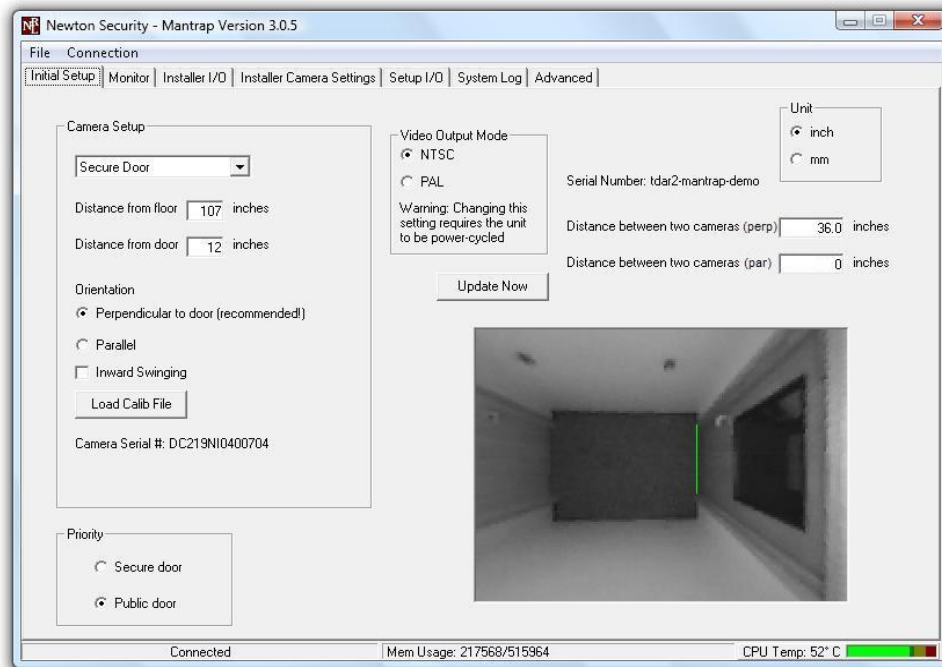
- Hide Debug Menu - This allows you to hide the Debug menu.
- Set Long and String Properties - The Set long and String properties allows you to manually enter values for properties that are not accessible with GUI.
- Clear Property Cache - Clears all long and string properties stored in the temporary memory
- Updates - The Update function is currently disabled.
- Packet Logging - The packet logging function logs all data, and commands sent from UI.

- Erase EEPROM - This function erases all current setting and restore unit back to factory defaults.
- Dump EEPROM - This feature allows you to save the current EEPROM setting to a file, for technical analyst/troubleshooting support from manufacturer.
- IP Networking - This allows you to change the IP address, subnet mask, and gateway that you unit uses to connect to your company internal network.
- Switch Setup - This function is currently disabled.
- Display Page Size - Shows screen resolution.
- Old-Style Saves Settings - This is another way to save settings to a file.

## Initial Setup

The initial Set-up tab is the place to begin the setup process. The initial setup tab contains the serial number of the T-DAR control unit.

**Note:** You will not be able to move to other tabs in the UI to complete the setup until all the fields in this tab have been filled out.



### Camera Set-Up

In this tab the technician inputs various distances of the camera heads from the door and the floor. Choose the orientation of the mantrap cameras and load the calibration files. Mount camera heads in line along the central axis of the mantrap unless there are limitations in space. See the mantrap diagram in section “Stereo Camera Heads.”

With the camera heads mounted parallel, set ‘Distance between two cameras (par)’. It is important that when mounting the camera heads in parallel to set the ‘dynamically scan passed the public head’ to -5. This option is configurable on the ‘Advanced’ tab.

### Video Modes

This is a disabled feature on T-DAR units built after 2011. New units have NTSC or PAL options set at the factory. When using a controller newer than 2011, do not adjust this setting. On units built before 2011, choose NTSC or PAL depending on the video output required. Reboot the unit after making changes to this setting.



### Green Line

There is a green line in the image of the mantrap on the lower right of this page. There will be a different green line for each camera. Manipulating this line using a mouse will change your scan region settings and should *not* be adjusted after setting up the scan regions on the Installer Camera Settings tab.

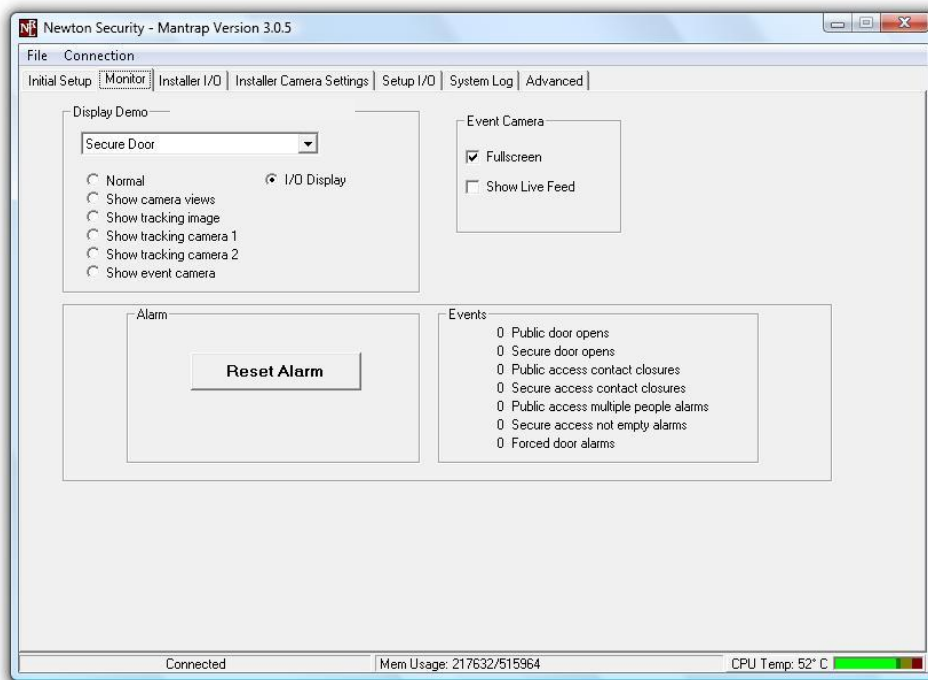
If you are not able to open certain tabs in the user interface, you may have incorrect settings. Follow the guidelines in this paragraph to allow viewing of the hidden tabs. For each camera head, check that the camera serial number displayed on the user interface matches the camera serial number printed on the camera head. Next, check that the ceiling height is correct for each camera head and finally, redraw the green line at the base of each door. Refresh the image (press update now) and draw a green line at the base of the corresponding door. Switch to the opposing camera head from the drop down menu. Refresh the image again, and draw a green line at the base of the corresponding door.

**Note:** Pressing “Update Now” will refresh the image only; it will not save or change any settings.

### Monitor Tab

The Monitor screen consists of a various menus that allow the user to change between cameras and views that will be displayed on the CCTV monitor. A list of camera views is available for selection by way of radio buttons. Also on this page is an Alarm Reset button for the annunciator, as well as mantrap event statistics. The statistics may be reset using the Reset Event Statistics button on the Setup I/O page.

**Note:** There are no installer configurable items on this page.





### **Display Demo**

The Display section of this screen controls what video displays on the monitor. The settings are unique to the door being monitored. The output chosen will be the video that is recorded during a security event.

- **Normal** - Event video out during alarm only
- **Show Camera Views** - Four video output – Camera Head images a (1) and b (2), tracking image, and event camera
- **Show Tracking Image** - Displays tracking image
- **Show Tracking Camera 1** - Camera Head image a (1)
- **Show Tracking Camera 2** - Camera Head image b (2)
- **Show Event Camera** - There is no event camera capability on the four head mantrap
- **Show I/O** - Displays the status screen for I/O diagnostics

### **Alarm and Events**

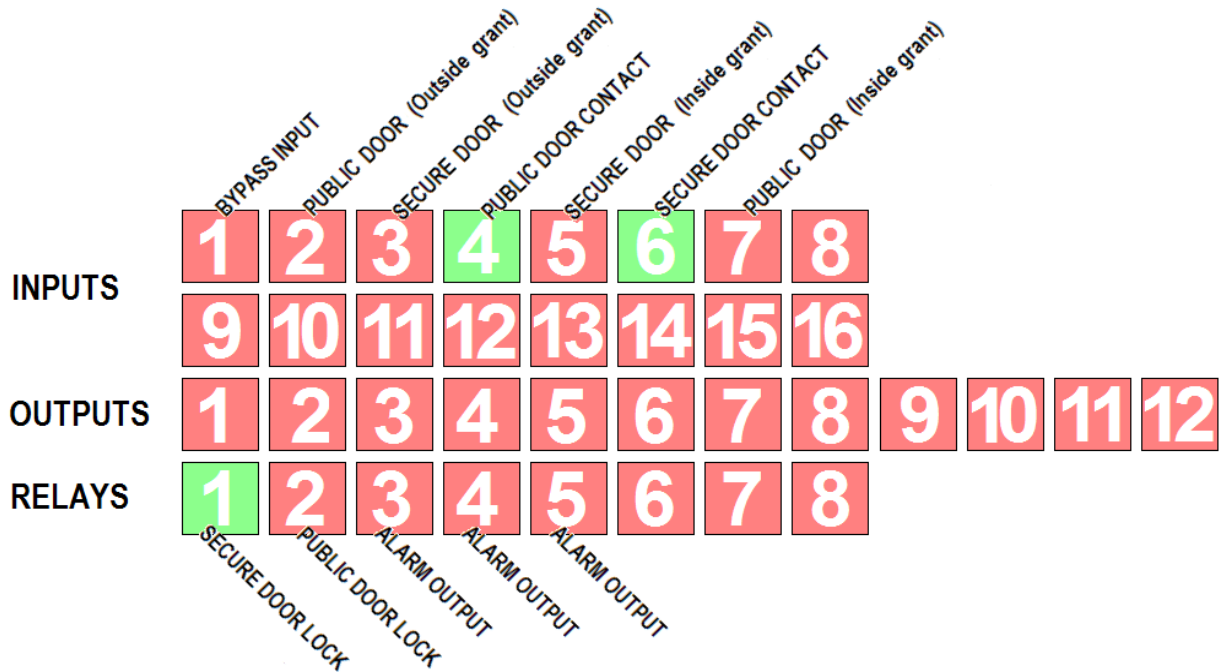
A button for manually resetting the alarm is available in the UI. Clicking Reset Alarm will clear an alarming security event and return the system to its normal monitoring mode.

### **Events Counter**

The Event Counter is a running log of the security scenarios being monitored by the T-DAR. Events are characterized by access events, door cycles, and security violation types.

### Inputs and Outputs – Only On Video Output

Connecting a monitor to the video or VGA port of the T-DAR controller allows viewing of the input/output status of the system. Use the input/output status during the T-DAR installation for troubleshooting. Switch the video mode in the user interface to display the input/output screen (shown below). To switch the video mode, connect with the user interface and open the “Monitor” tab. In the “Monitor” tab, under “Display Demo”, select the option “I/O Display”. If nothing shows on the monitor, reboot the T-DAR controller with the monitor turned on and plugged in to the video output port.



## Relays

The T-DAR system communicates to access control through the use of dry relay outputs. Green squares on the bottom row of the image below represent output relays that are closed. There are two door lock relays (1 and 2) as well as two alarm output relays (5 and 6). A green square, relay 1 or 2 will always represent a locked door. There is no option to invert a relay's output status. To invert an output, use an external relay to invert the electrical signal (from normally closed to normally open). Relays 3, 4, 7, and 8 will not be used. None of the outputs 1-12 will be used in this mantrap system. Do not use relays three and four for alarm outputs, as these are reserved for custom functions.

**Note:** It is normal for relay 1 to stay on (green), locking the secure door. The T-DAR will not keep both doors locked at any time.

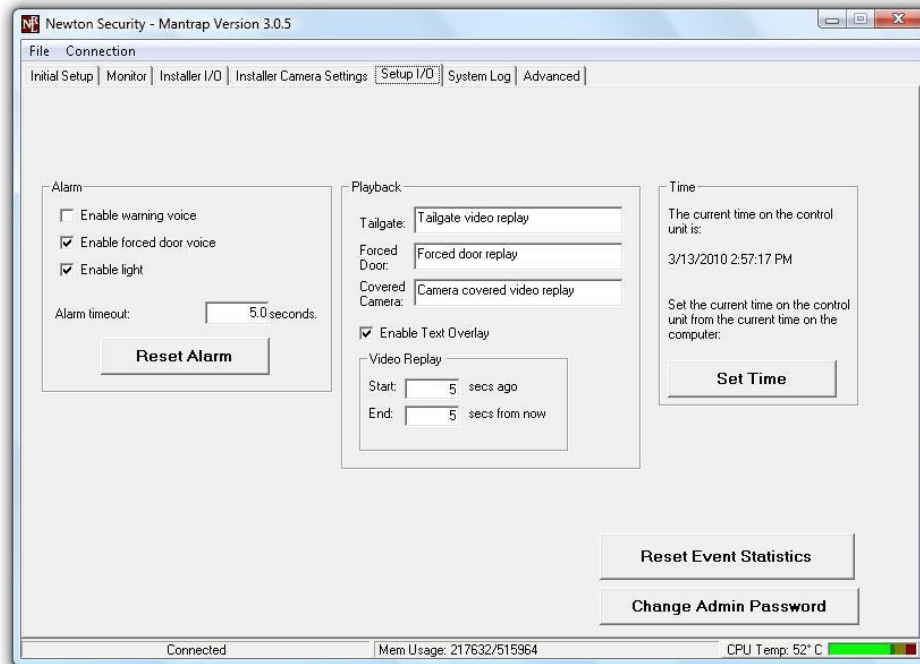
## Inputs

The status of the inputs, such as door contacts and valid access signals, place the mantrap in various states. The mantrap will not function correctly if the inputs do not signal at the appropriate times. A green state on inputs 4 and 6 will always represent a closed public and secure door, respectively. Changing input states, from red to green, on 3 and 5 will represent incoming valid access signals. The Secure Door, Secure Side reader is input 3 and the Secure Door, Public Side reader is input 5. Changing the normally open/closed status of T-DAR inputs is an option in some T-DAR mantrap systems. If the normally open/closed status of the input is not adjustable in this T-DAR system, use an external relay to invert the input signal.

**Note:** To unlock the secure door, both doors must be closed and the headcount in the mantrap must be either 1 or 0, depending on whether the public reader or the secure reader is accessed.

## Setup I/O

The Setup I/O screen consists of an Alarm section, Playback section, and a Time section. Resetting Event Statistics and changing the Administrator Password are also available. These items are detailed below.



### Alarm

The alarm section consists of check boxes that allow the user to disable all of the various alarm enunciation provided by the annunciator unit. There is also an Alarm Timeout box that defines how long the unit will annunciate for before resetting. Setting this value to zero causes the unit to be in manual reset mode, with no local alarming. Below the Alarm Timeout is a Reset Alarm button that resets the T-DAR alarm when clicked.

### Playback

The four head mantrap does not have the capacity to record or playback event video, so this section will not be used. This section is used on smaller and larger mantrap systems, such as the two head and six head systems. The Playback section lists the three types of alarms that will cause the T-DAR system to generate an event video replay. Next to each of these titles is a text box where the user can enter specific text that will be displayed over the event playback video. Additionally, there is a check-box that is used to enable text overlay of user specified text, as opposed to the default text as set by the manufacturer.

### Video Replay

The Video Replay section allows the user to specify the length of the event video that is played upon a violation. The event video is played only once, at the moment of the violation. The event video will play at the same time the alarm signal is sent to access control. The Start time defines the beginning of the event video relative to the time of the violation. The End time defines the end of the event video relative to the time of the violation.

## **Time**

The Time section allows the user to set the time that is kept by the controller. This time stamp is also displayed in all event video images. Clicking the Set Time button will set the time on the control unit to that of the PC running the User Interface.

**Note:** Corrections for the beginning or ending of Daylight Savings Time must be performed manually.

## **Reset Event Statistics**

The Reset Event Statistics is used to reset the statistics located on the Monitor page.

## **Change Admin Password**

The admin password is the second highest level of access available to users. This prevents access to the Monitor, Setup I/O, and Setup View tabs of the system. To configure the password, the button is clicked and then a password is typed either on the on-screen keyboard or on the host computer keyboard. If a mistake is made, use the backspace key to remove characters one by one, or the clear key to clear all of the characters simultaneously. Once the password is entered, press the OK button to make password permanent. To disable password protection, remove all characters from the password field. If the password is lost, contact the integration company maintaining this T-DAR system, or Newton Security, Inc.

## **Installer Camera Settings**

The Installer Camera Settings screen consists of a pull-down, an Image Type section, an Update Now button, a Viewing Window, a Physical Setup section, a Sensitivity Section, and a Configuration Section. The Installer Camera Settings are detailed below.

### **Image Type**

The image type section is used to select what camera is viewed in the image below. Various images can be selected using the associated radio buttons. All mantrap cameras, Secure 1, Secure 2, Public 1, and Public 2 may be shown individually.

### **Viewing Window**

Use the Image Type section to select views from each camera. The T-DAR system scan regions outline the areas of observation. The areas outside the scan regions are ignored. The Viewing Window allows for modification of the scan regions by clicking and dragging directly in the image. The Left, Top, Right, and Bottom fields are updated as new scan region are drawn.

To draw a region (red box) in the Viewing Window, the image displayed must be one of the two unwarped images. Position the mouse pointer over the top left corner of the area you want to draw the box around. Click and hold the left mouse button and drag the pointer to the location that sets the "red box" to the appropriate size. Changing the region will open a confirmation window, asking if the change is valid. To erase a region from the Viewing Window, click anywhere in the window.

**Note:** be sure that the image is current each time the picture is referenced. Update the image by clicking on "Update Now".

## Configuration

The configuration section is used to define the regions of interest for tracking. The regions are selected by clicking on the corresponding radio button and are then defined by drawing a box in the viewing window. Draw a scanning region in the viewing window by clicking and dragging with the mouse. Alternatively, the values may be entered in the numeric fields adjacent to each radio button. See the section entitled Viewing Window on the previous page for more information on adjusting region area.

## Update Now

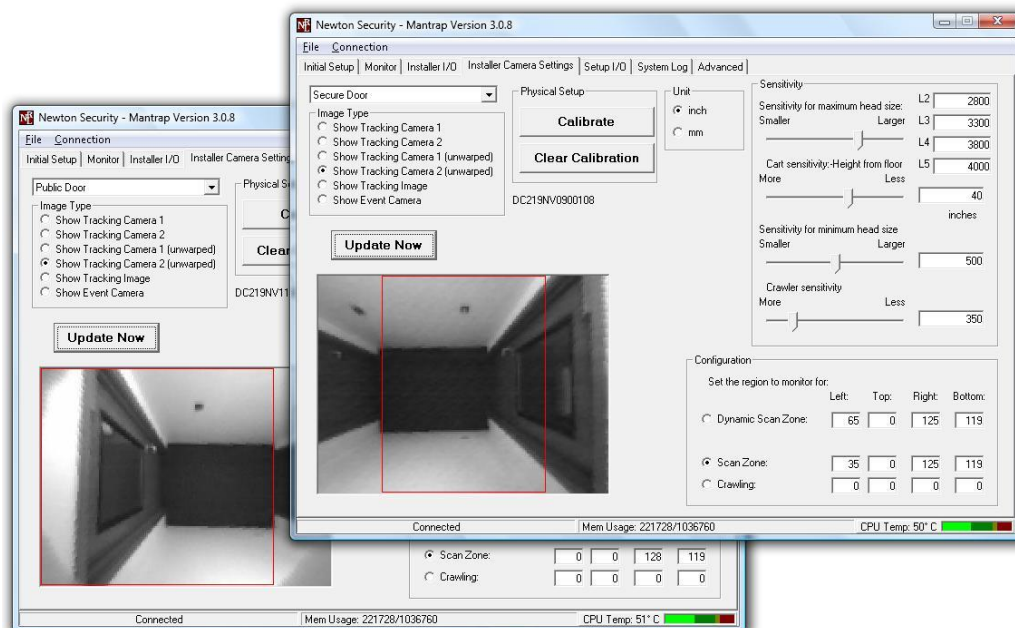
The update now button updates the image in the Viewing Window. Updating affects the viewing window only; no settings are updated. Ensure that the image is current each time the picture is referenced. Update the image by clicking on “Update Now”.

## Scan Zone

If tailgating is attempted, it will be detected within the Scan Zone region during the static scan. The static scan occurs once per transaction/passage and requires a quarter of a second (0.25/sec.) to complete. When multiple people are detected during the static scan, the T-DAR annunciator will sound the prerecorded message: *“Please exit and try again in ten seconds”*. During entry, the static scan occurs after a public access grant is received and both doors are closed. The public access reader is located adjacent to the secure door, on the inside of the mantrap.

During egress, the static scan’s occurrence is customizable. There are three options for the dynamic scan on egress:

- *Option 1)* no static scan on egress. The mantrap interlocks the doors, without scanning.
- *Option 2)* automatic static scan after the secure door closes behind a person. No access grant required from inside the mantrap.
- *Option 3)* the static scan occurs after a public access grant, located on the secure door, inside the mantrap.



## Setting Scan Zones

A separate scan zone must be drawn for each camera head. From the perspective of the T-DAR tracking, the Scan Zones will be combined into one large scan area. The scan areas can be seen by selecting the Scan Zone radio button and selecting "Show Tracking Camera 2 (unwarped)" (or the unwarped camera 1). Select the appropriate camera head from the dropdown menu, above the "Image Type" section. Click "Update Now" to update the Viewing Window. The Scan Zones for each camera head should be large enough that when a person stands between camera heads, the T-DAR displays a headcount of one. Also, the Scan Zones should be large enough that when a person stands against the walls/doors, the headcount remains one. The headcount is displayed on the output video. When switching between the secure-end camera and the public-end camera, update the image each time by pressing "Update Now".

The Scan Zone regions are less sensitive than the Dynamic Scan Zone regions, because of their short scan time. With the shorter scan time of the static scan, there is a reduced potential for false alarming. The Scan Zone regions will be set larger than the Dynamic Scan regions, because of their lower false alarm potential. Set the Scan Zone regions large enough to detect a person standing in any point of the mantrap, especially the corners and center of the mantrap.

**Note:** The following rules should be adhered to when setting up the Scan Zones:

- 1) The edge of the Scan Zone for the public-end camera head should extend to the top of the public door. The Scan Zone of the public camera head should cover the door, so that a person standing against the door will be detected. If there is a window with activity outside the mantrap, the Scan Zone can be moved to avoid detection through the window.
- 2) Extend the edge of the Scan Zone for the public camera head to the base of the opposing door. The Scan Zone of the public camera head should cover the floor completely.
- 3) The edge of the Scan Zone for the secure-end camera head should extend to the top of the secure door. The Scan Zone of the secure camera head should cover the door, so that a person will be seen standing against the door. If there is a window with activity outside the mantrap, the Scan Zone can be moved to avoid detection through the window.
- 4) Extend the edge of the Scan Zone of the secure camera head, to the base of the opposing door. The Scan Zone of the secure camera head should cover the floor completely.

## Dynamic Scan Zone

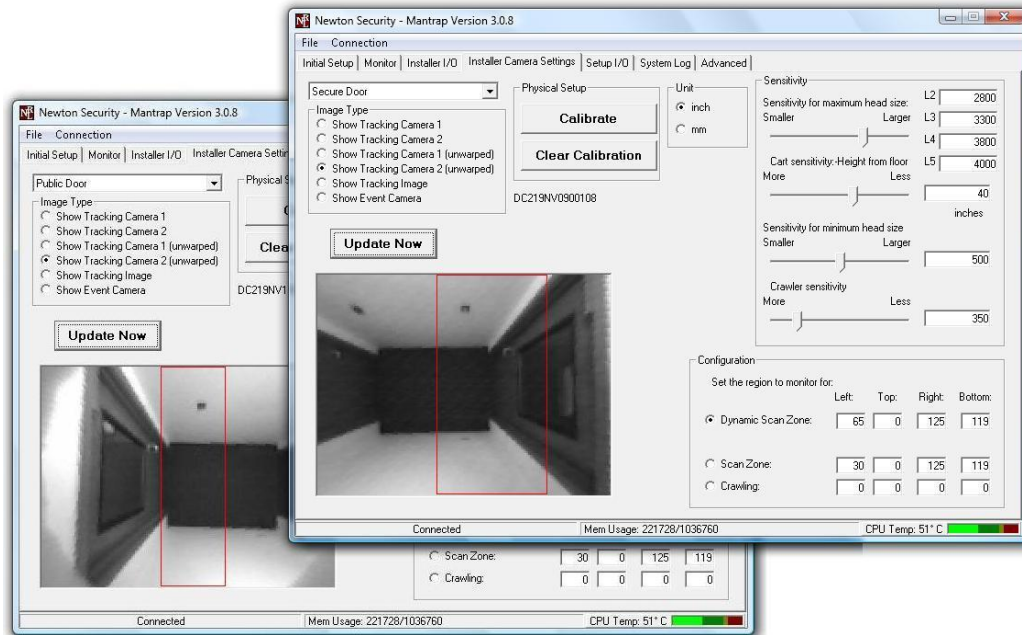
The purpose of the dynamic scan is to detect a person tailgating through the public door. While the public door is open, tailgate detection *only* occurs in the Dynamic Scan Zones. The dynamic scan occurs once per *entry* transaction/passage and continues until the public door is closed. Whenever the public door contact switch is open, the T-DAR is scanning in the regions of the Dynamic Scan Zone. The dynamic scan does not occur on egress.

During entry when the public door is opened, if two people walk into the dynamic scan zones, an alarm is triggered. When this violation occurs, a recorded voice announcement saying "*Only one person at a time allowed through door*", an alarm tone sounds and an alarm signal is sent by T-DAR, notifying security that two people have entered the mantrap. The scanning in the dynamic zones will occur for the entire period the public door is open and will cease when the public door closes. When the public door closes, the dynamic regions are no longer used for the remainder of the transaction/passage. During the length of time the public door is open, the T-DAR will alarm whenever multiple people show up under the combined dynamic areas. If the public door is left open, dynamic scanning will continue indefinitely.



## Setting Dynamic Scan Zones

A separate dynamic scan zone must be drawn for each camera head. The dynamic areas can be seen by selecting the Dynamic Scan Zone radio button and selecting “Show Tracking Camera 2 (unwarped)” (or the unwarped camera 1). Select the appropriate camera head, from the dropdown menu above the “Image Type” section. Click “Update Now” to update the Viewing Window.



The dynamic regions are more sensitive than the scan zone regions, because of their longer scanning time. The dynamic scanning regions should be set smaller than the scan regions. Set the dynamic regions small enough to avoid moving objects, such as the public door.

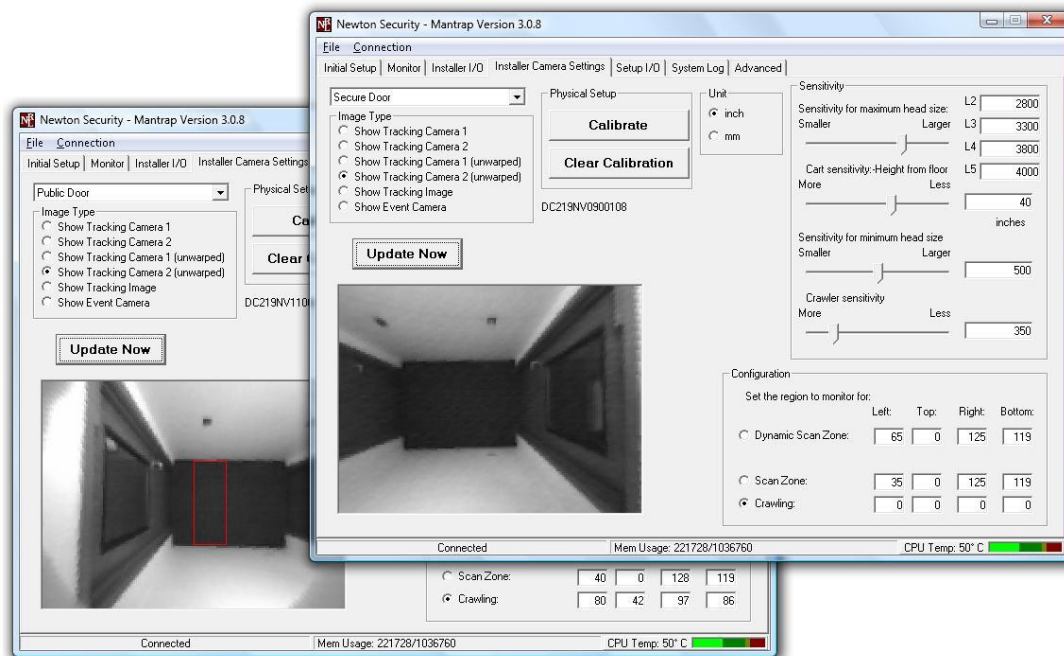
**Note:** The following rules should be adhered to when setting up the dynamic zones:

- The edge of dynamic zone for the public--end camera head should extend to the base of the public door, but not cover any portion of the public door.
- Extend the edge of the dynamic zone of the public camera head to the center of the mantrap floor. The dynamic zone of the public camera head should cover half of the mantrap floor.
- Extend the edge of the dynamic zone for the secure-end camera head to the center of the mantrap floor. The dynamic zone of the secure camera head should cover half of the mantrap floor.
- The edges of the dynamic zones, adjacent to a wall, may extend up the full length of the wall.
- Adjust both dynamic regions so that they do not pick up objects outside of the mantrap, i.e. people walking on the other side of a glass window.



## Crawling

The purpose of the crawling zone is to detect a person crawling through the public door in an attempt to defeat the detection system. An object seen in the crawl zone will be considered a person crawling when certain criteria are met. To be considered a crawler and produce an alarm, the object must be shorter than cart height, “Cart sensitivity – Height from floor”. To be considered a crawler, the object must meet a certain size threshold, “Crawler sensitivity”. Everything in the Crawl Zone below cart height will be considered a crawler unless a standing person is seen under the corresponding camera head. When there is an object in the crawl zone and a person is seen under the corresponding camera head, the object is considered a cart and no alarm will occur. Crawl detection occurs at all times, whether the public or secure doors are open or closed.



## Setting the Crawling Area

The region of interest for crawling should be the width of the door and centered under the camera as much as possible (notice the red box is drawn centered in the image). The crawling region should be about 17 pixels deep. To set the crawling zone at 17 pixels, adjust the numbers in the Configuration section, for the Public Door. In the Configuration section adjust the numbers for the left and right of the Crawling zone. The Right Crawling number, minus the left crawling number, should be 17 pixels.

Place a gap between the public door and the Crawl zone to reduce false alarming on persons leaving the mantrap through the public door. A 15 pixel gap will ensure that a person’s feet and legs are not detected in the Crawl zone as they leave the mantrap (through the public door). If the Crawl zone is placed too close to the public door, false alarms may occur when exiting the mantrap, through the public door. A false alarm will occur when a person’s feet or legs are detected in the Crawl zone, but their upper body has disappeared from the Scan Zone region (see Scan Zone section, above).

**Note:** The crawl region is very sensitive to objects near the floor, even when the doors are closed. Be sure that the mantrap is calibrated and that the Cart sensitivity is not lower than 30 inches. Set the Crawler sensitivity above 400 when there is excessive sunlight, dirt, or tracking on the floor.

### **Entry from Public / Exit to Public**

If your UI contains regions for 'Entry from public side' and 'Exit to public side', set these values to zero. They are not used in the T-DAR Mantrap system. For these regions, set all fields to zero.

### **Calibration**

The physical setup section consists of two buttons used to control the camera calibration process. The Calibrate button is used to teach the system about the scene that is being monitored. When the system has learned the environment, the tracking image will become stable and black, until new objects appear in the mantrap. When calibrating, be sure that the mantrap is in empty, the doors are closed, and that all signage has been hung in the mantrap. If ambient sunlight is a factor, calibrate during the brightest part of the day.

The Clear Calibration button is used to show the unfiltered tracking image. It is not necessary to use Clear Calibration before calibrating the mantrap. Using the cleared calibration image, the installer can determine the effect of various objects in the field of view on the tracking system. Also, refer to the Clear Calibration section for information on clearing calibration when using a Door Position Sensor. A door position sensor will only be installed on a *public* door that swings into the mantrap space, under a camera head.

**Important Note:** calibrations must be performed when the scene is completely stable. The scene must be stable for several seconds after the button is clicked.

### **Sensitivity**

The sensitivity section contains slider bars for maximum head size, cart sensitivity, and crawler sensitivity. Adjacent to each of these sliders is a numeric box that shows the numeric equivalent for the slide position. The values may be adjusted by either manipulating the slider or by direct entry of the values in the numeric box. It is recommended to use numeric entries over the slide bars, as commonly used numeric values have been derived and will be suggested throughout this manual.

### **About Settings**

The use of stereo machine vision analysis allows the system to assign a fairly constant numeric value to an object regardless of how far or close the object is to the camera lens. This number represents the amount of pixels the system needs to see in order to place a cross-hair on an object

### **Minimum Head Size**

Minimum head size sets the threshold for the detection of a person. The unit for Minimum head size is in pixels. The T-DAR stereo algorithm locates an object in the mantrap and labels the object a person when the minimum number of pixels is seen on the top of the object. When the T-DAR detects the requisite amount of pixels, it will place a visible green cross on the top of the object. Every green cross that the T-DAR places under the combined public and secure camera heads will represent the number of people in the mantrap. The green crosses can be monitored on the video output of the T-DAR controller. You must switch back and forth between camera heads on the video output to see every cross. You will see a red cross when the maximum head size is violated (see Maximum head size, below).

The Minimum head size sets the size threshold for an object to be considered a person, without incorrectly identifying smaller objects as people. Various extraneous objects will be detected as people when the Minimum head size is too small. These objects include anything over cart height, such as door hardware, arms, hands, hoods, and any carried objects. (*continued*)

Set the Minimum head size threshold large enough to ignore these extraneous objects. To stop a small object from being detected as the head of a person, set the minimum head size threshold larger than this object. Setting the Minimum head size too large will cause the system to ignore smaller people. A standard value for Minimum head size is 450 to 600. Watch the tracking video of a person in the mantrap. If the person's tracking blob is split into separate sections and receiving two crosses, set the Minimum head size large enough to ignore the smaller section.

The monitor output can be configured to show the number of persons detected under a camera head by displaying a "Head Count". The video output shows a screen split into four different sections. The bottom two sections show the raw images from the camera head. The upper left image shows the tracking image from the camera head and the upper right section will show replay video after a violation. To use the T-DAR video output, select 'Show Camera Views' from the monitor tab. The public door or the secure door may be individually selected for monitoring.

**Note:** It is recommended to use numeric entries over the slide bars, as commonly used numeric values are provided in this manual.

### **L2, L3, L4 and Maximum Head Size**

The goal in setting the maximum head size is to set it small enough that an alarm occurs when two people try to defeat the T-DAR system by walking close together into the mantrap.

The values L2, L3, and L4 represent various horizontal cross sections of a person's body at various heights, measured from the top of the head. The value L2 corresponds to the area (in pixels) one inch down from the top of a person's head. The value L3 corresponds to the area two inches down from the top of a person's head. The final value L4 corresponds to the area nine inches down from the top of a person's head (shoulder area roughly). L5 will only be used when carts are not allowed in the mantrap. When the system is set to alarm on carts, set the Cart sensitivity to thirty inches and L5 to 4000. Typical values for L2, L3, and L4 are 2500, 3200, and 3800 (in pixels), respectively, for ceiling higher than 9.0 ft. (2.75m). For ceiling under 8.5 ft. (2.6m), set L2, L3, and L4 to 3000, 3500, and 4000, respectively.

An alternative method of adjusting the maximum head size is to use the slider for maximum head size. The maximum head size slider controls the value that determines the largest object that can be called a head without allowing more than one person to proceed through the portal. It is recommended to use numeric entries over the slide bars, as commonly used numeric values are provided in this manual.

As the maximum head size is violated, the cross on a person's head will be red. A red cross on a person means that the person is larger than the L2, L3, and L4 cross sections. The head of a person may be determined to be too large for various reasons, including the following:

- The occupant may have swung their arm away from their body,
- They may be talking on a cell phone,
- They may be wearing a large hood,
- They may be carrying an object above cart height,
- They may be wearing a backpack
- They may be standing next to another person.

A small amount of trial and error may be necessary to account for these occasions.

*(continued)*

The monitor output is used to show green and red crosses under each camera, individually. You will not be able to view tracking crosses on a person who is not under the camera head you have selected. The video output shows a screen split into four different sections. The bottom two sections show the raw images from a camera head and the upper left image shows the tracking image from a camera head. The upper right section will show replay video after a violation, if a security camera is connected to the event “Cam1” input. To use the T-DAR video output, select ‘Show Camera Views’ from the monitor tab. The public door or the secure door may be individually selected for monitoring.

### **Cart Sensitivity**

The cart sensitivity slider controls the maximum height of cart that will be allowed to pass through the mantrap. Stated another way, everything below Cart Sensitivity – height from floor will be ignored, except persons. An object below this height will be considered a cart when it is in close proximity to a person. When not in close proximity to a person, an object below this height will be considered a crawler. The cart height should be set low enough to detect anyone walking through the mantrap and high enough to ignore carts pushed through the mantrap. There should be at least one Crawler zone in the mantrap, located at the public door (see section Crawling, above).

Under the public camera, false alarming will occur when an object is seen in the crawl zone (below cart height), but no person is standing in the Scan Zone (see Scan Zone, above). If an object is seen in the Crawler zone with no one in the Scan Zone, for at least one second, the system will alarm.

**WARNING:** Use caution in placing a crawl zone under the secure camera head. A false alarm will occur if a cart appears in a secure crawl zone, but no person is seen standing under the secure camera head.

Typically only one crawl zone is drawn in the mantrap, under the public camera head (see Crawling section, previously). For higher security, carts can be disallowed from use in the mantrap. To disallow carts from being used in the mantrap, set the Cart Sensitivity to 30 and set L5 to 4000.

### **Crawler Sensitivity**

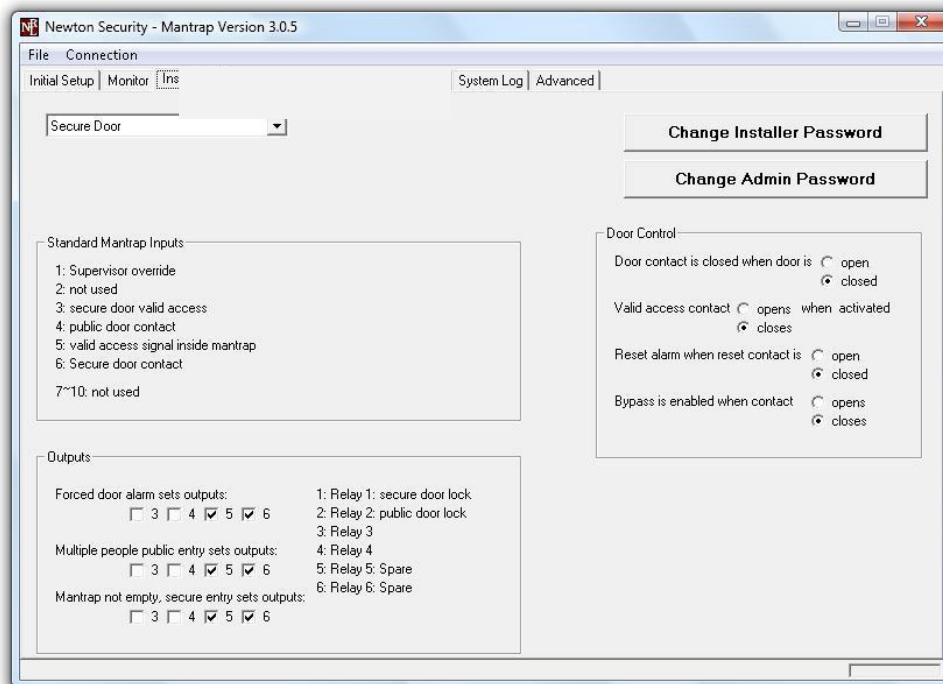
The crawler sensitivity controls the value that determines the size a specific object must be larger than to be called a crawler (crawling person). An object will be considered a crawler when:

- The object resides inside of the crawling region
- It is larger than the crawler value specified (in pixel area)
- It is not in close proximity to a person.

An object that is taller than the Cart Sensitivity value will not be considered a crawler. An object that is next to a person will not be considered a crawler. Objects that are considered crawlers will cause an alarm. A typical value for Crawler Sensitivity is 350.

## Installer I/O

The Installer tabs are for configuring the interface with the other components of the installed security system. Provisions for configuring the Outputs, Door Setup and Sensitivity are accessed from these screens. These screens can be password protected for Installer and System Administrators use only.



### Setup of Inputs

The configurable options of the Door Control section allow for adapting T-DAR to the existing peripherals to correctly trigger the unit. The logic state for these devices is selected by clicking the check box that reflects the installation. For example, if the door contact passes continuity when the door is closed, the door contact is said to be closed when the door is closed. The same logic is true for the Access Contact and the Alarm Reset. Use the following steps for diagnosis:

### Door Contact

1. On the Monitor tab, observe the count for door opens (reset the counts on the "Setup I/O" tab if necessary).
2. Open and hold the door.
3. If the door open count advances by one, the switch is set correctly.
4. If the door open count does not advance, close the door.
5. If the door open count advances when the door closes, the switch is set incorrectly.
  - If the count does not ever change, switch the display mode to Show I/O and observe the input output display on the video monitor.
  - If no changes are observed on the screen during testing, verify wiring of device to T-DAR.

### Valid Access Contact

On the Monitor tab, observe the count for Valid Access Contact (reset the counts on the “setup I/O” tab if necessary).

1. Perform a Secure Door, Public or Secure Side Valid Access Grant.
2. If the Valid Access Contact count advances by one immediately, the switch is set correctly.
3. If the Valid Access Contact count does not advance immediately, but takes a second or more to advance, the switch is set incorrectly.
  - If the count does not ever change, switch the display mode to Show /O and observe the input output display on the video monitor.
  - If no changes are observed on the screen during testing, verify wiring of device to T-DAR.

### Setup of Outputs

There are six relays on a CB-210 control unit for connecting signals from the T-DAR. The first relay is for the secure door lock, Relay 1A and Relay 1B. The second relay is for the public door lock, Relay 2A and Relay 2B. Relays four through six are for the tailgate alarm and forced door alarm. Activating the relay is caused by enabling the selected relay number to make contact when an alarm event is present.

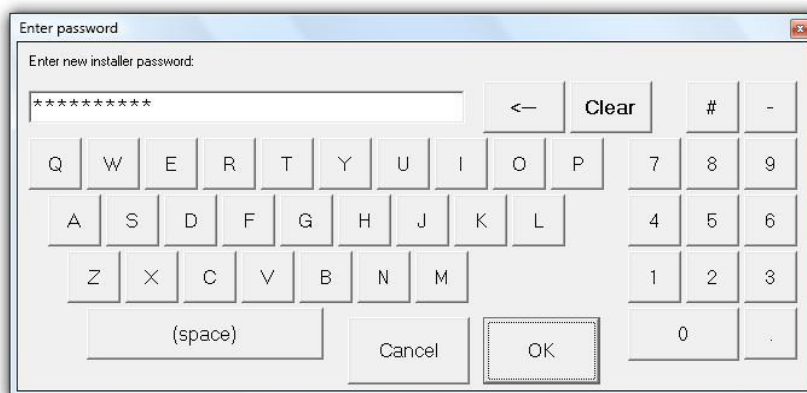
For example, selecting check box number four of the Forced Door Alarm output, enables Relay 4 to close when either the public or secure door is forced open. Likewise, when check box number five of the Multiple People Public Entry is selected, Relay 5 will close when tailgating occurs.

Setting triggering events for both doors independently is not possible. Otherwise, any combination of relays and triggering events may be selected. There is no specification as to how the relays are to be implemented. Regardless of whatever the control situation dictates there are three ways to close any of the relays.

### Change Administrator Password

Use the same process as changing Installer Password. If the administrator password becomes lost, contact the T-DAR system installer or Newton Security.

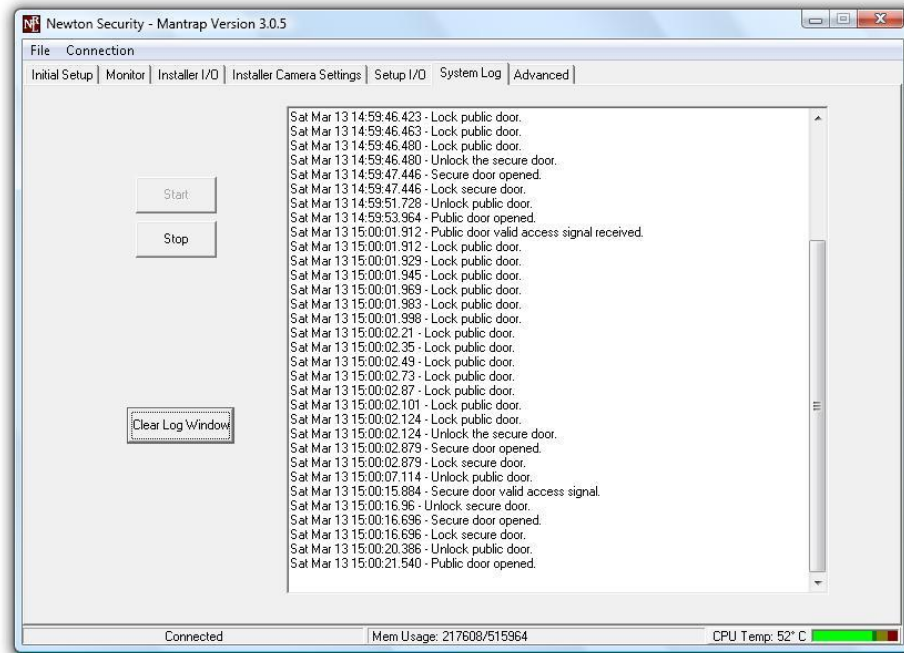
Change Installer Password





## System Log

This tab allows you to see the activity of the system, when doors open and close, what alarms have been active and what inputs and outputs have been triggered.

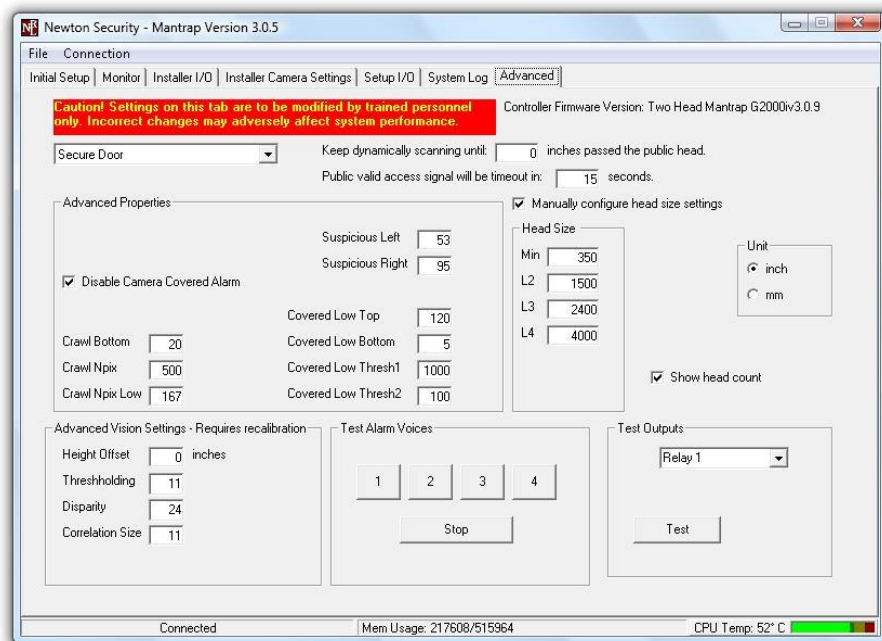


## Advanced Tab

The Advanced screen consists of a number of user-definable options that can override several of the standard controls of critical system functions detailed in previous tabs.

**WARNING:** Items on this screen should only be adjusted at the direction of qualified Newton Security personnel.

When the camera heads are mounted in a *parallel orientation*, the setting for 'Keep dynamically scanning until 'x' inches passed the public head' will need to be set to -10. Values above this do not work for cameras mounted in a parallel orientation.





## 9. CRITICAL ELEMENTS TO MAINTAIN PROPER OPERATION

Once correctly installed, the T-DAR mantrap system does a superb job of detecting violations of access control security systems. In order to accomplish this task, the T-DAR requires several critical elements and/or signals from the doors and the access control system as detailed in this manual. If after installation environmental or access control signal conditions become degraded, the T-DAR system may not operate properly. Consult the Installation/Setup sections of this manual for the correct values for these elements.

### *Factors That Could Cause Improper Operation*

**Wiring or programming changes in access control may cause mantrap malfunction.**

When changes are made to the access control system, check that the T-DAR control unit is still receiving and sending the proper signals. The input and output signals can be checked by observing Event count on the Monitor tab of the user interface, or by simply testing the mantrap for proper operation. Testing the mantrap is easily done by passing through it normally, inward and outward. In addition, ensure the tailgate triggers when a tailgate occurs.

**The T-DAR system requires adequate and consistent lighting for accurate operation.**

The T-DAR system uses stereo video analysis to determine three-dimensional characteristics of targets and requires sufficient lighting to perform this task. Equal and consistent lighting allows the system to identify and track targets in all areas of the detection pattern.

**To operate properly, T-DAR units must be mounted in areas that maintain suitable temperatures.** Consult the Product Description or Specifications portions of this manual for suitable conditions for each T-DAR component. The CB100/200 control unit utilizes long life fans but these may need service after a number of years. The visible LED's on the front of the CB210/CB410 provide visual indication of high temperature conditions. LED 3 will turn yellow or red if the T-DAR control box is over the recommended temperature. In addition, the S100 annunciator red signal light flashes continuously if the T-DAR unit has shutdown.

### *Testing the Tracking*

#### **Test the Scan Zone Areas**

Connect a monitor to the video output of the T-DAR system. To use the T-DAR video output, select 'Show Camera Views' from the monitor tab of the user interface. The public door or the secure door may be individually selected for viewing by selecting the drop down menu (Installer Camera Settings tab) and using the up and down arrow keys (on keyboard) to switch between camera heads.

Have someone walk around inside the mantrap with their arms at their side and both doors closed. Observe the headcount on the video monitor and ensure that the count remains one for the entire the time the person is in the mantrap. More specifically, have the person walk the perimeter of the mantrap, close to the walls and doors. If the headcount drops to zero, enlarge the Scan Zone regions on that camera head until the headcount returns to one. If two crosses are showing on a person against the wall, decrease the Minimum head size until one of the crosses disappears.

**Note:** More accurate results will be obtained if the subject is wearing dark clothing.

Again, have your person walk the center of the mantrap several times, wall to wall, between camera heads, while ensuring that the headcount remains one. If the person registers a headcount of two, while standing in the center of the mantrap, check that the proper camera spacing is entered on the user interface, height and head locations. Use a meter to ensure the light levels are adequate and be sure the mantrap is calibrated. When two crosses are shown on one person, in the same image, the minimum head size may be set too small. Increase the minimum head size until one of the crosses disappears.

### **Test the Dynamic Scan Areas**

Connect a monitor to the video output of the T-DAR system. To use the T-DAR video output, select 'Show Camera Views' from the monitor tab of the user interface. The public door or the secure door may be individually selected for viewing by selecting the drop down menu (Installer Camera Settings tab) and using the up and down arrow keys (on keyboard) to switch between camera heads.

Have someone walk around inside the mantrap while observing the headcount on the video monitor. More accurate test results will be obtained if the subject is wearing dark clothing. Prop the public door open and have the person walk through the mantrap to the secure door. Propping the public door open, causes the system to scan only the Dynamic areas.

Ensure that the headcount remains one or zero the entire the time the person is in the mantrap. The headcount will change to zero when the person is outside a Dynamic Scan zone or in the middle of two separate Dynamic Scan zones. If the headcount reads two when the person is in the center of the mantrap (public door open) the Dynamic Scan zones may be overlapping. Adjust the Dynamic Scan zone on each camera head so there is less overlap in the center of the mantrap.

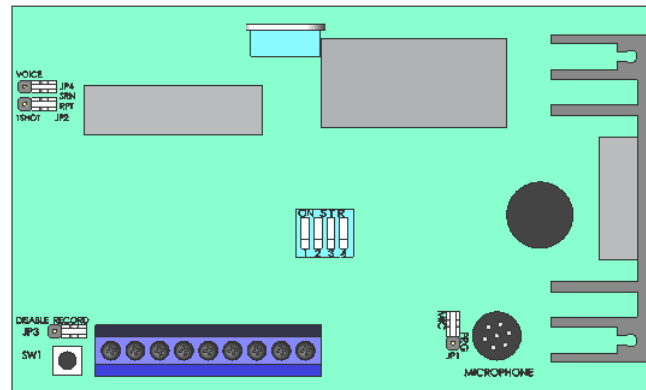
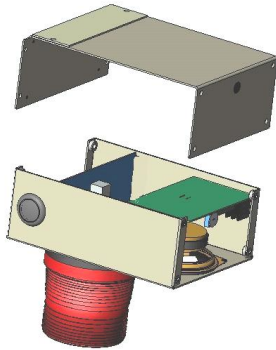
Use a meter to ensure the light levels are adequate and be sure the mantrap is calibrated. When two crosses are shown on one person, in the same image, the minimum head size may be set too small. Increase the minimum head size until one of the crosses disappears. Repeat the process several times, propping the public door open each time, and walking all the way to the secure door. Ensure that no alarming is occurring during this testing.

**Note:** More accurate results will be obtained if the subject is wearing dark clothing.

**Front Panel Indicator LED's on the CB210 Control Unit**

LED	Use		Description
1	T-DAR Status	Off Flashing Yellow Flashing Green Flashing Red Any color- steady state	Firmware and software not running Firmware running-software in self-check Firmware and software running-Normal Firmware running-software stopped  Firmware and software stopped
2	Ethernet connection	Off Green	No Ethernet connection Ethernet connection established (Will take a couple of seconds to respond)
3	Processor Temperature	Green Yellow Red Flashing Red	Less than 55° C-Normal 56° C to 65° 66° to 70° C Over 70° C (Annunciator will produce a timed signal)
4	Power	Off Green Red	No Power to the unit Power supplied and breaker is not tripped Power supplied and breaker is tripped

## Changing the Voice Announcements via the Built-In Microphone



1. Remove the six (6) 6/32 Phillips head screws that attach the top cover. Gain access to the printed circuit board within the annunciator.
2. Ensure that JP1 is set MIC, JP2 is set Repeat, JP3 is set to Record and JP4 is set to Voice.
3. Locate the record switch SW1 in the rear right corner of the circuit board.
4. Select, via the one of the four STR DIP switches, the message you wish to record over. This message will repeat until its switch is restored.
5. Depress and hold the record switch SW1 and speak the new message clearly into the unit.
6. Release the record switch when complete. Your new message should now be playing repeatedly.
7. If satisfied with the new message, restore the STR DIP switch selected for reprogramming to its normal off position.
8. Replace and secure the cover with the (6) 6/32 Phillips head screws.

**Note:** if recording voices into a microphone is not desirable, contact Newton Security for other methods of adding new announcements. This will require sending the unit to Newton Security for programming.

### External System Maintenance

Periodically, the unit should be inspected for any signs of damage or build up of debris on the camera head as well as the intake and exhaust ports of the controller. Remove any debris with a damp cloth.

## Troubleshooting

This section provides fundamental hardware troubleshooting for the T-DAR. For problems that are not covered in this section, contact your local Newton Security Inc. Authorized Distributor.

### Tips for getting a good image

- Make sure that the light is consistently illuminated across the entire mantrap. Avoid “can style” lighting and filament bulbs, which are often too bright directly underneath and too dim at the perimeter.
- Ensure the floor, walls, and surrounding physical environment are free from bright reflections. Bright reflections may cause the T-DAR system to perceive a person when the mantrap is empty. Bright reflections should be physically minimized. Loosening the T-DAR settings may be required to overcome a reflection issue. Problems with bright reflections can be reduced by increasing the Minimum Head Size to approximately 400, so that the reflection is too small to be considered the head of a person. Additionally the scan zone region can be decreased so that it does not encompass the reflection. Do not use this method if the region size has to be reduced, so far, that security is compromised. The mantrap scan zone regions should be large enough that a person standing anywhere in the mantrap will be detected.

### Problems Communicating with the T-DAR

<p><i>The user interface will not connect with the T-DAR System</i></p>	<p><u>Try the following first:</u></p> <ul style="list-style-type: none"> <li>▪ Wait 30 seconds and try reconnecting.</li> <li>▪ Reboot the T-DAR control unit and try reconnecting. (<b>Note:</b> Be sure that the T-DAR control unit is fully booted; approximately a three minute process)</li> <li>▪ Check the Ethernet cable to ensure it is connected properly</li> <li>▪ Ensure that an Ethernet connection is established (This is verified by a green light on LED 2)</li> <li>▪ Make sure that only one copy of the user interface is installed on the laptop or PC.</li> <li>▪ Ensure you are using a crossover Ethernet cable when connecting directly to a laptop or PC</li> <li>▪ Make sure your Laptop or PC is set to 10.0.0. # with a sub – mask of 255.0.0.0 when connecting directly</li> <li>▪ Turn off the computer, restart, and try again.</li> </ul> <p><u>If the above suggestions do not provide results, follow the procedures below to further troubleshoot communications:</u></p> <p><b>Call your Newton Security Inc. Authorized Distributor</b></p> <p>Arrange with your local distributor to substitute a working T-DAR unit and laptop to determine where the problem exists.</p>
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## Imaging Problems

To assist in troubleshooting, connect the T-DAR to any NTSC color monitor. Use a BNC cable and adapters to connect from the monitor to the Imager Out terminal on the top panel of the T-DAR unit. This will allow you see what the imager is viewing in terms of bright spots, reflections, and other imaging problems.

<p><i>The Image Is Entirely Blue</i></p>	<ul style="list-style-type: none"> <li>▪ Make sure the BNC cable is connected properly to the Camera Head and to the Control Unit.</li> <li>▪ Be sure that the camera sync cable (CAT-6, straight through) is properly connected.</li> <li>▪ Ensure that the monitor is connected and that 'Show camera views' is selected on the user interface. Connect with the user interface. Open the monitor tab and select 'Show camera views' for the camera.</li> <li>▪ While connected with the user interface, turn to the Installer Camera Settings tab and view the appropriate camera in the Viewing Window.</li> <li>▪ Connect the camera BNC directly to the monitor to check for a proper video image. Try a different cable if necessary.</li> <li>▪ Contact your Newton Security Inc. Authorized Distributor.</li> </ul>
<p><i>The Image Is Black</i></p>	<ul style="list-style-type: none"> <li>▪ Make sure the BNC cable and Power Control cable is properly connected to the system unit and to the Camera Head.</li> <li>▪ Be sure that the camera sync cable (CAT-6, straight through) is properly connected.</li> <li>▪ Ensure that the monitor is on, is connected, and that 'Show camera views' is selected on the user interface. Connect with the user interface. Open the monitor tab and select 'Show camera views' for this camera.</li> <li>▪ Point the Imager at a bright light. If the live image is entirely black, then contact your Newton Security Inc. Authorized Distributor.</li> </ul>

<p><i>Random Pixels Appear In The Image</i></p>	<p>This is commonly caused by electrical noise generated by motors and controllers connected to, or near, the T-DAR control unit or camera head/cables. This random image noise can adversely affect performance and should be minimized.</p> <p>Use the following guide to try to isolate the cause of the noise:</p> <p><b>STEP 1:</b> The idea in this step is to determine what a normal image looks like for comparison. Try to electrically isolate the T-DAR Series to determine a known or normal visual pattern on the video monitor. If it is not possible to electrically isolate the unit at its normal mounting position, take the T-DAR Series away from the area where inspections are being performed and connect it to another Camera Head. Determine the normal image.</p> <p><b>STEP 2:</b> Determine the noise. Reconnect to the T-DARA normally. Block the lens to produce a dark image so that you can see the electrically induced noise.</p>
<p><i>Random Pixels Appear In the Video Output</i></p>	<p>Remove the unit from its current mounting- repeat Step 2.</p> <ul style="list-style-type: none"> <li>▪ Change the power source-repeat Step 2.</li> <li>▪ Change the ground connections-repeat Step 2.</li> <li>▪ Disconnect controllers and drives one at a time from the control panel-repeat Step 2.</li> <li>▪ Physically move the T-DAR (or Camera Head cables) away from the machine-repeat Step 2.</li> <li>▪ Continue with these suggestions until the source of the noise is discovered.</li> </ul> <p><b>Note:</b> A common solution is to isolate the T-DAR ground circuit from the ground circuits of heavy machinery.</p>
<p><i>The Image Is Too Dark</i></p>	<ul style="list-style-type: none"> <li>▪ Increase the overall light by increasing the intensity of the illumination source in the mantrap, or by increasing the number of illumination sources.</li> <li>▪ Replace the stereo camera head if the problem persists.</li> </ul>
<p><i>The Image Is Too Bright</i></p>	<ul style="list-style-type: none"> <li>▪ Decrease the illumination source or number of sources.</li> <li>▪ Replace the stereo camera head if problem persists.</li> </ul>

<p><i>The Image Is Blurry</i></p>	<p>You may need to:</p> <ul style="list-style-type: none"> <li>▪ Clean the lens. Clean lens ensures that the images acquired by the Camera Heads are accurate. This is important to the performance. The lens can be cleaned with a commercial glass cleaner and a lint-free cloth. You may need to clean the lens daily in dusty environments.</li> <li>▪ Move the Stereo Tracking Head. The wrong camera heads may be installed for this mantrap. Verify the correct head is being used. If correct, verify the height and placements are accurate. If the cameras and placements are correct, then contact your Newton Security Inc. Authorized Distributor.</li> </ul>
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### All Monitored Events Are Failing

<p>If a working installation suddenly returns failed inspections for all or most of the mantrap monitoring, a change in lighting conditions or a new surface may have been introduced into the mantrap. Recalibrate both camera heads to adapt to this new environment. T-DAR stereo camera heads may have been bumped or have had their views obstructed; be sure they are in place and free from obstruction. Observe the video output of all the tracking cameras to find abnormalities.</p>	
<p><i>Check the lighting conditions</i></p>	<p>A light source that dims over time or a light source that has gone out completely can affect the performance. Make sure that your light sources are strong and positioned correctly. Good lighting is essential to getting a good image and to security monitoring performance. To see the effect of the lighting, select an output that best displays the problem and monitor the live image.</p>
<p><i>Check to see if the stereo camera head is out of position</i></p>	<p>Put the Camera Head to its original position. If you are unsure, reposition it as close to the original location as possible. If you cannot reposition the unit properly, connect the control unit to the host computer and redo setup in the user interface</p>



## Inputs/Outputs Are Not Functioning as Required

<p>If the inputs and outputs are functioning differently than expected, there are several solutions for this. When there is question as to whether the inputs and outputs are switching correctly, connect a video or VGA monitor to the control box. To observe the status of inputs and outputs on the monitor, select 'I/O Display' on the 'Monitor' tab of the user Interface.</p>	
<p><i>The secure door is not locking</i></p>	<p>The secure door should remain locked at all times, except when a valid inside-secure or outside-secure grant is received by the T-DAR controller. At which time the door will be unlocked until the door is opened.</p> <ul style="list-style-type: none"> <li>▪ Observe output relay 1 on the monitor display. Ensure that it is green.</li> <li>▪ If it is not, open the user interface and press Ctrl+Shft+S. In the 'Set Long Property' dialog box, enter 'tdar3.locked.closed'; press enter, then enter 1 and press enter.</li> <li>▪ Open this box again and enter 'tdar3.1.locked.closed'; now again, enter the number 1.</li> <li>▪ Disconnect the terminals Relay 1A and 1B. With a voltmeter check for continuity. If there is continuity check the access control wiring for correctness.</li> </ul>

## The Secure Door Will Not Open After A Valid Access Grant

<p>When the T-DAR system does not open the secure door after a valid access grant, there may be an incorrect head count in the mantrap.</p>	
<p><i>The secure door is not opening after a Secure Door, Public Side valid access grant.</i></p>	<ul style="list-style-type: none"> <li>▪ The mantrap may be empty or there may be more than one person in the mantrap. In order for the T-DAR system to unlock the secure door after a public valid access grant, there must be one person in the mantrap.</li> <li>▪ The public door may be open. Close the public door; the T-DAR will never let both doors open at the same time.</li> <li>▪ The system may be un-calibrated. Calibrate the T-DAR system.</li> </ul>

## 10. DETAILED SPECIFICATIONS – CB210MT Control Box

### ***Power Specifications\****

Operating Voltage Range	24 VDC $\pm$ 10%
Peak Voltage (Non-continuous)	30 VDC
Required Amperage	10 Amps
<i>*Note: Power supply not included</i>	

### ***DC Input Specifications***

Minimum Pulse Width	0.4 mSec
ON Voltage Level	>10 VDC
OFF Voltage Level	< 2 VDC
Input Impedance	2.2 K $\Omega$
Minimum ON Current	>10 mA
Maximum OFF Current	<0.1mA
OFF to ON & ON to OFF Response	0.2 mSec Typical
Maximum Input Current	10mA@12VDC, 20mA@24VDC
Commons	Three Commons: General 2, Portal/Head 1&2

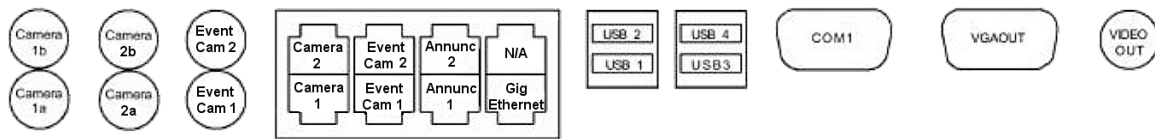
### ***Relay Output Specifications***

Minimum-Maximum Voltage Range	0 – 30 VDC
Peak Voltage	<50 VDC
Maximum Current (resistive)	2 A
Maximum Inrush Current	5 A
OFF to ON Response	0.2 mSec Typical
ON to OFF Response	0.2 mSec Typical

### ***Auxiliary Power Outputs***

+5 VDC	Incorporated over-current breaker
+12 VDC	Incorporated over-current breaker
+24 VDC	Incorporated over-current breaker

## Upper Front Panel Connections



- Camera 1a:** Input, BNC connector from Stereo Camera Head 1, camera a. Used for secure, right camera head.
- Camera 1b:** Input, BNC connector from Stereo Camera Head 1, camera b. Used for secure, right camera head.
- Camera 2a:** Input, BNC connector from Stereo Camera Head 2, camera a. Used for public, right camera head.
- Camera 2b:** Input, BNC connector from Stereo Camera Head 2, camera b. Used for public, right camera head.
- Event Cam 1:** Input, BNC connector from Stereo Camera Head 3, camera a. Used for secure, left camera head. (Connect camera head 4 to A400)
- Event Cam 2:** Input, BNC connector from Stereo Camera Head 3, camera b. Used for secure, left camera head. (Connect camera head 4 to A400)
- N/A:** RJ-45 Interface, connection for 4 head adaptor box (A400). 4 Head adaptor box contains two BNC connections for Head 4.
- Camera 1:** RJ-45 Interface, Standard 10BaseT Cat-6 Ethernet cable to Stereo Camera Head 1 for Power/Control. Used for secure, right camera head.
- Camera 2:** RJ-45 Interface, Standard 10BaseT Cat-6 Ethernet cable to Stereo Camera Head 2 for Power/Control. Used for public, right camera head.
- Event Cam 1:** RJ-45 Interface, Standard 10BaseT Cat-6 Ethernet cable to Stereo Camera Head 3 for Power/Control. Used for secure, left camera head.
- Event Cam 2:** RJ-45 Interface, Standard 10BaseT Cat-6 Ethernet cable to Stereo Camera Head 4 for Power/Control. Used for public, left camera head.
- Annunc 1:** RJ-45 Interface, Standard 10BaseT Cat-6 Ethernet cable to Annunciator for Power/Control.
- Annunc 2:** RJ-45 Interface, (*Not used on mantrap systems*)
- Gig Ethernet:** Ethernet Interface, Standard Cat-6 Ethernet cable to Local Area Network

<b>USB 1-4:</b>	Interface, Standard USB-2 communications for flash memory, mouse, keyboard, etc.
<b>Com 1:</b>	Interface, RS-232 interface for secondary communications with processor
<b>VGA Out:</b>	Output, 15 pin VGA for connection of computer monitor for local system control.
<b>Video Out:</b>	Output, BNC connector to video monitor for set-up and monitoring

## **Connection Details**

### **Video Out**

BNC Connector—System output in video format. Output is in RS170 (NTSC). Optional PAL output is available on special order. This video output is used for displaying inspection results of the T-DAR system in real time and processed video. The Video Out output is not available for RGB or S-Video,

### **Input 1**

The alarm bypass is an opt-isolated input used to reset the alarm event for the T-DAR mantrap. Changing the state of this input stops the audio output from the annunciator unit. While enabling this input, the strobe will flash and the T-DAR will allow multiple persons to pass through the mantrap after a Secure Door Public Side access grant. A Secure Door Secure Side valid grant will not allow the secure door to be opened while the bypass is enabled.

### **Relay 1**

Form-factors A relay for control of the secure door lock. This relay is normally closed and opens only after certain conditions are met, including a Secure Door Public Side grant or Secure Door Secure Side grant. Relay 1 will never open when the public door is open or unlocked.

### **Relay 2**

Form-factors A relay for control of the public door lock. This relay is normally open and closes only when the secure is open or unlocked.

### **Relays 3 - 6**

The T-DAR unit is equipped with four form-factors A relays that can be configured to activate on various user selectable conditions. Also, the normal state of these relays is user definable to allow for greater flexibility in integrating the system with a variety of access control systems. Four of the relays are located on the General 1 connector, and the fifth (sixth) relay is located on the Portal connector.

### **Line Lock Input**

The T-DAR uses the Line Lock input to sync with the local power grid. This input is useful in applications where the video input to the T-DAR system needs to be synchronized with the lighting, such as low-frequency fluorescent or other types of flickering lighting.

### **Input Common**

The common terminal is used to define the operation of the inputs on all four connectors, independently. If a dry contact is to be used for bypass on the General 2 connector, a small jumper wire will be installed between the +12VDC terminal and the common terminal. This allows the mantrap bypass terminal to generate a reference voltage that can be sensed when the terminal is shorted to ground.

If a wet contact is to be used, the small jumper wire would be installed between the common terminal and the ground terminal on the General 2 connector. Also, a bond wire from the external power supplies ground terminal will need to be placed in the Ground terminal as well to provide for ground bonding.

### **RS232 TX**

The T-DAR reads data in from external sources or outputs data from the vision system via a RS422 serial connections found on the Phoenix I/O Connectors. Use the specific section of this user's guide for application details on available inputs, outputs and configuration of this port.

### **Input 4 and 6**

These are door contacts used to monitor the status of the door position switches (open or closed). Inputs 4 and 6 monitor the public and secure doors, respectively. This should be a dedicated switch, and normally requires the installation of a double pole/double throw door position switch.

### **Input 3 and 5**

The valid access grant switches must be electrically isolated from the access control system to allow for proper operation. This will typically require the installation of a double pole/double throw relay that controls the lock and also provides an output to the T-DAR system.

**Note:** It is acceptable for the T-DAR to receive the signal before the door is unlocked, but not after.

**WARNING:** Failure to use isolated circuits or using access control system auxiliary outputs/relays to simulate the valid access switch activity may result in poor system performance. There can be no noticeable time lag in the receipt of valid access grant switch signals by T-DAR.

The valid access grant switch will connect to the Portal Digital Input terminal and to either ground or +12v (or applicable source voltage) dependent upon installation type.

### **Input 2 and 7 - 14**

Not Used