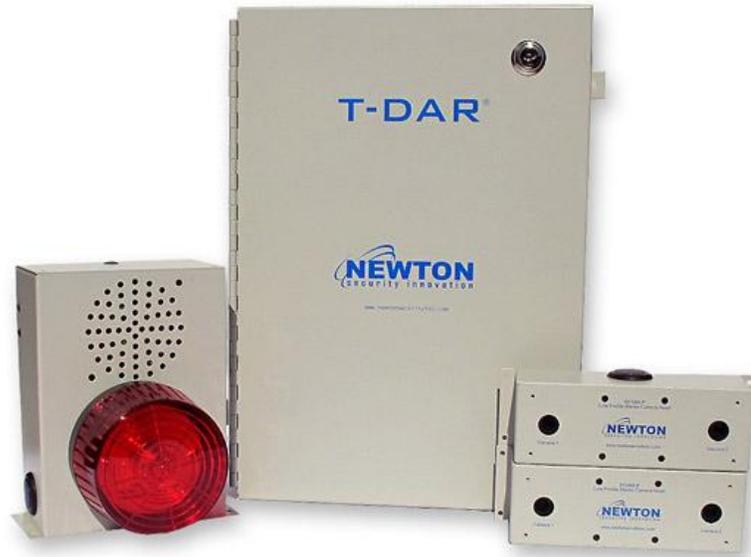




T-DAR[®] TAILGATING / PIGGYBACKING DETECTION SYSTEM

Installation and Operation Manual



Two Head Mantrap

T-DAR Model T2010MT

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[®] (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

CB110MT/CB210MT/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)

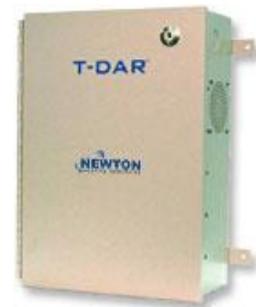
Weight: 26lbs (11.7 kg)

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 110° F (5° - 43 ° C)
(optional high and low temperature systems available)

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



S100 Annunciator (optional)

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 significantly increase 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, do the following test on a bright day when there is full sunlight exposure:
 - Turn off all lighting fixtures in the mantrap and in the surrounding area.
 - If you can read this manual or similar text 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.
 - 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.
 - This results in an opaque section, between three and five feet above the floor, and will prevent the cameras from detecting a person standing on the other side of the glass.

Mantrap Height

- The minimum camera height for proper tracking of the T-DAR cameras is 2600mm (8.5 ft). Persons taller than 6.3 ft. (1.9m) may receive higher false alarm rates in mantraps with camera heights lower than 2600mm (8.5 ft).
- For ceilings between 2410mm (7.9 ft) and 2600mm (8.5ft), camera height extending kits are available.
- For low false alarm rates, mount the camera head at 2750mm (9ft) or higher.

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. If the mantrap is built over the specified size, a larger three or four head T-DAR system should be purchased.

- The maximum length of a mantrap with cameras lower than 2740mm (9ft) is 2740mm (9ft).
- The maximum width with cameras lower than 2740mm (9ft) is 1450mm (4.75ft).
- The maximum length of a mantrap with cameras above 2740mm (9ft) is 3000mm (10ft).
- The maximum width of a mantrap with cameras above 2740mm (9 ft) is 1500mm (5ft).

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 2740mm (9ft), space the two camera heads no more than 1400mm (4.5ft) apart.
 - For camera heights above 2740mm (9ft), space the two camera heads no more than 1500mm (5ft) apart.
 - For camera heights below 2740mm (9ft), ensure there is no more than 700mm (2.25ft) from each camera head (camera center) and all adjacent doors and walls.
 - For camera heights above 2740mm (9ft), ensure there is no more than 760mm (2.50ft) from each camera head (camera center) and all adjacent doors and walls.

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.
- Video cable runs should be un-interrupted, with no junction points or splices

Floor Surface

Avoid reflective or patterned floors within a mantrap.

- Use a light shade floor. A light shade floor will provide a good contrast between dark clothing and the floor.
- Install carpeted or mat flooring rather than hard/tiled flooring. This will reduce light reflections from the floor.
- 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, although we recommend using a color that does not show dirt or tracks.

Hardware & Finishes

Avoid reflective horizontal surfaces as may exist on door hardware and glass frames. Reflective spots will degrade the T-DAR tracking ability in the area of the reflection.

- When selecting door panic hardware inside the mantrap, select hardware with a black or bronzed finish if possible. Apply a non-reflective coating on the top surface if 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. Failure to provide adequate lighting will result in increased false alarm rates, as well as the possibility of missing a violation.

- 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.
- The use of direct lighting, such as can-style fixtures, or filament-style bulbs is discouraged, because the directional lighting of these bulbs may create bright reflections.
- If the mantrap has a tiled and/or polished floor, take care that the lighting is highly diffuse.
- The minimum acceptable amount of lighting for proper operation of the T-DAR system is 300LUX. Illumination must be added if the levels are below this level.
- Record downward light, measured at a level approximately 1m (40 inches) above the floor. When taking measurements hold the light meter away from the body.
- 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).
- If sunlight is a factor, take all light measurements after dark.

Access Reader Placement

- Avoid mounting the access reader(s) between camera heads (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 an output of 10 Amps is required.
- A power supply is NOT included with the T-DAR system.

Additional Installation Tips and Known Issues

When using electric solenoid locks, place reverse voltage diodes across the solenoid terminals to reduce voltage feedback to the T-DAR controller. When using external relays, use reverse voltage diodes across the solenoid of the relay to reduce voltage feedback to the T-DAR controller.

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.

Light the area under the cameras well. Take care to ensure that lighting conditions do not change over time. If lighting conditions do change, recalibrate the T-DAR to accept the new lighting conditions.

If the mantrap lighting consists of low frequency fluorescents, use a line lock transformer (provided with the T-DAR system). Failure to use a line lock transformer with low frequency fluorescent lighting may result in erratic system performance.

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

- The secure door remains locked in the initial reset state.
- A person first enters through the public door. Depending on the mode of operation, the public door may be access controlled or left unlocked when the mantrap is not in use. With bidirectional mode enabled, the T-DAR will not allow entry through the public door, with the mantrap occupied or while the secure door is open.
- The T-DAR scans the environment while the public door is open. If two people enter, the system will alarm. After any alarm, the occupant(s) must exit.
- When the public door closes after entry, a person will access the Secure Door, Public Side reader, initiating a static scan.
- 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 and bidirectional tracking

- The secure door remains locked in the initial reset state.
- A person will first access the Secure Door, Secure Side reader to unlock the secure door. The public door will lock or remain locked if it is access controlled.
- After an access grant, the person will enter the mantrap through the secure door. Accessing the Secure door, Secure side reader with the mantrap occupied will not unlock the door.
- The T-DAR scans the environment while the secure door is open. If two people enter, the system will alarm. After an alarm, the occupant(s) must exit.
- Depending on the mode of operation, when the secure door closes after entry, the occupant may be required to access a reader. The secure side reader will be accessed or the Public door, Secure side reader if there are two readers in the mantrap.
- If an access grant is required, the system will perform a static scan after the access read. If no access read is required, the system automatically scans.
- 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 secure door.

4. BASIC INSTALLATION

Outputs

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

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

Inputs

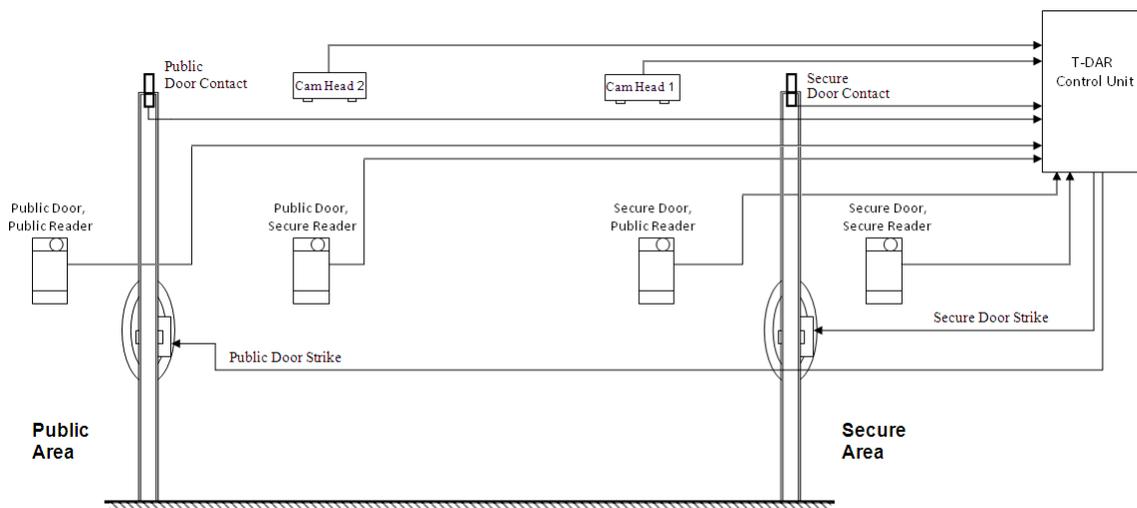
The T-DAR controller contains inputs for door closures and access control devices

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

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

WARNING: Do not mount the Secure door, Public side reader in the centre of the mantrap. Mount the reader on the wall directly under a camera head where tracking accuracy is higher.

- All inputs terminate across a specific input terminal and ground.
- The T-DAR controller does not accept any valid-access signals from the public door.
- The T-DAR controller will only lock the public door when the secure door is open or unlocked. In a normal state, T-DAR does not hold the public door locked. Normal access control through the public door is optional, but not provided by T-DAR.
- 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 inputs and outputs

Component Mounting

Before any installation is begun, make sure that the proposed locations provide adequate room for all electrical conduits that may be necessary. You may find dimensions for the specific components in the components section of this manual.

Local Device Placement

- **Place components such as the camera head and Annunciator unit within a certain distance of the controller to minimize the effects of voltage drop.**
- Do not exceed a distance of 61m (200ft), unless using a Cable Extender/Amplifier unit. Information about costs and part numbers of the Cable Extender/Amplifier is available from Newton Security.
- Allow adequate clearance for installing conduit.

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 inches between each TDAR unit and other physical barriers, for proper ventilation. Do not mount one T-DAR control unit in a location where its heated exhaust passes 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.

- 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.
- 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.

WARNING: Do not modify the T-DAR control unit, by cutting or drilling, as this will void the warranty. Cutting or drilling will likely damage the unit by spreading debris to external/internal connection ports and other internal components. If new or larger conduit holes are required, contact Newton Security, Inc.

Stereo Tracking Head Mounting

- Mount the camera heads directly to the 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 two-head T-DAR installation of this type should be in a space no larger than 1500mm x 3000mm (5ft by 10ft).

Annunciator Unit Placement

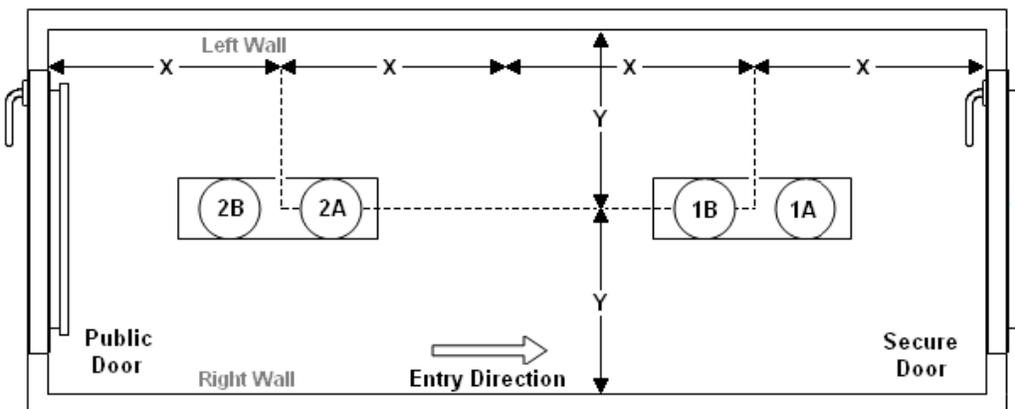
The Annunciator should be mounted within 61m (200ft) of the control unit. Locate the Annunciator unit within the mantrap to announce violations to the occupant as well as persons in the secure area. The Annunciator unit is fitted with conduit knockouts on the sides of the unit. Maintain adequate clearance 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

Place the cameras in accordance with the diagram shown below. Locate camera head one (1A & 1B) on the secure end of the mantrap. Position the cameras in line with one another and perpendicular to the doors. If the doors are not located at the ends of the mantrap (as shown below), consult Newton Security for assistance on placement of the heads. Center each camera between the left and right walls of the mantrap. Align each camera parallel to the left and right wall (shown below). Space the cameras as in the diagram below, making the distance between the two cameras (camera center's) equal to half the length of the mantrap.

Note: if the ceiling is less than 2600mm (8.5ft), consult Newton Security technical support before proceeding.

Camera Head Placement



A typical mantrap - top view

Cabling

Camera

- For each camera head run two video coaxial cables (75 Ohm) with BNC connectors.
- For each camera head, run a single CAT-5 (Ethernet) cable.
- Label the cables so that cameras 1a, 1b are easily distinguishable.
- Label the cables so that cameras 2a, 2b are easily distinguishable.

Annunciator Connection

Connect the Annunciator to the T-DAR control unit using a CAT-5 cable. Plug the RJ45 into the “Annunc1” port of the T-DAR controller. Do not use “Annunc2” port.

Camera Terminations

Camera Head

- On each Camera Head, install and terminate two video coaxial cables (75 Ohm) with BNC connectors.
- On the face of each camera head, the labels “Camera 1” and “Camera 2” correspond to camera connections “a” and “b” respectively.

Control Unit

- For camera head one (1), mounted near the secure door, attach the CAT5 connector to the “Cam 1” port on the T-DAR upper panel.
- For camera head two (2), mounted near the public door; attach the CAT5 connector to the “Cam 2” port on the upper panel.

T-DAR Input and Output Terminations

On the control unit, install and terminate an adequate number of wires to support the inputs and outputs.

- One pair of wires for each access reader/button. If your mantrap setup has four access readers/buttons, then eight wires must be terminated at the T-DAR unit for readers.
- One pair of wires for each door contact. You must terminate four wires at the T-DAR control unit for door contacts.
- Terminate one pair of wires for the override signal. The override input is used to allow multiple people through the mantrap.
- Terminate one pair of wires for each T-DAR alarm output. There is an alarm output for Forced Door and another alarm output for when two people enter mantrap.
- Terminate one pair of wires for each door lock output. Relay one will control the secure door lock and relay two will control the public door lock.
- If status outputs are used, terminate two wires for each of these. Optional status outputs are “mantrap occupancy”, “one person occupancy”, “multiple person occupancy”, and “mantrap in-use”.
- If there is a door encoder on the public or secure door, terminate eight wires from a CAT5 cable at the T-DAR unit.

5. Modes of Operation

Bidirectional Tailgate Detection

A mantrap with bidirectional tailgate detection will stop tailgating on egress, as well as entry. A bidirectional mantrap will utilize the same access control hardware as a mantrap with single direction detection, including door locks, door contacts, and access readers. A mantrap with only single direction tailgate detection will allow egress of multiple people at one time.

Depending on the installation, there are three optional methods of egress in a bidirectional mantrap. In the first method, there is only one reader inside the mantrap. In this setup, a valid access grant on the inside reader will initiate a scan and allow passage through the public door. In the second method, there are two readers inside the mantrap. In this setup, a valid access grant on the Public door/Secure side reader (inside the mantrap) will initiate a scan and allow passage through the public door. A third option for egress does not use an internal access grant, but scans the mantrap automatically on egress.

A mantrap employing bidirectional detection may utilize the same access control hardware as a mantrap with single direction tailgate detection, including door locks, door contacts, and access readers. In other words, you may switch from unidirectional to bidirectional mode without changing hardware or wiring. When no access grant is required inside the mantrap during egress, the system will scan automatically as soon as the secure door closes. The override functionality is the same in the entry direction as in the egress direction.

Automatic Door Control

The T-DAR can provide outputs for automatic door control. There is a dry contact relay output for the public side door and another for the secure side door. Each relay is customizable, providing a rising edge or closing edge to open the doors. When signaling the doors to open, the relay outputs will be momentary, resetting immediately or after the door opens.

With automatic door control enabled, the T-DAR will require two access devices on the secure door. An access reader will be located on both sides of the secure door. The T-DAR will open the secure door after receiving a signal from either of these two access control devices (provided there is a proper headcount in the mantrap). The secure door should open after receiving a pulse from the T-DAR unit.

An access reader is required on both sides of the public door. The access reader on the public side will provide access to the door. An access device such as a button is required on the inside of the mantrap. This device will allow a person locked inside with no valid access credentials to exit the mantrap. If the person without valid access credentials entered through the public door, then using the button will open the public door. If the person without valid access credentials entered through the secure door, then using the button will open the secure door.

Number of Access Control Devices

The mantrap may contain two 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 side, Secure door/Public side, Public door/Secure side, and Public door/Public side. The Public door/Secure side access device is commonly a button.

Option 1 – Two access control devices

Utilizing only two access control readers, the public door will not be access controlled by T-DAR (an alternate system may provide access control for the public door). In this setup there will be an access control reader on both sides of the secure door. With the proper headcount detected, T-DAR opens the secure door after receiving a signal from either device. The access control reader 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

Utilizing three access control devices on the mantrap, there will be only one access reader inside the mantrap. Depending on the direction of travel, the access reader inside the mantrap will send signals to the T-DAR controller for opening the public or secure doors. An access device such as a button is required on the inside of the mantrap. This device will allow a person locked inside without valid access credentials to exit the mantrap. The two access control devices on the outside of the mantrap (each door) will allow access to the mantrap.

With one person in the mantrap during entry, the internal reader will unlock the secure door. With one person in the mantrap during egress, the internal reader will unlock the public door. The T-DAR may be configured to allow egress without a read on the internal reader.

Option 3 – Four access control devices

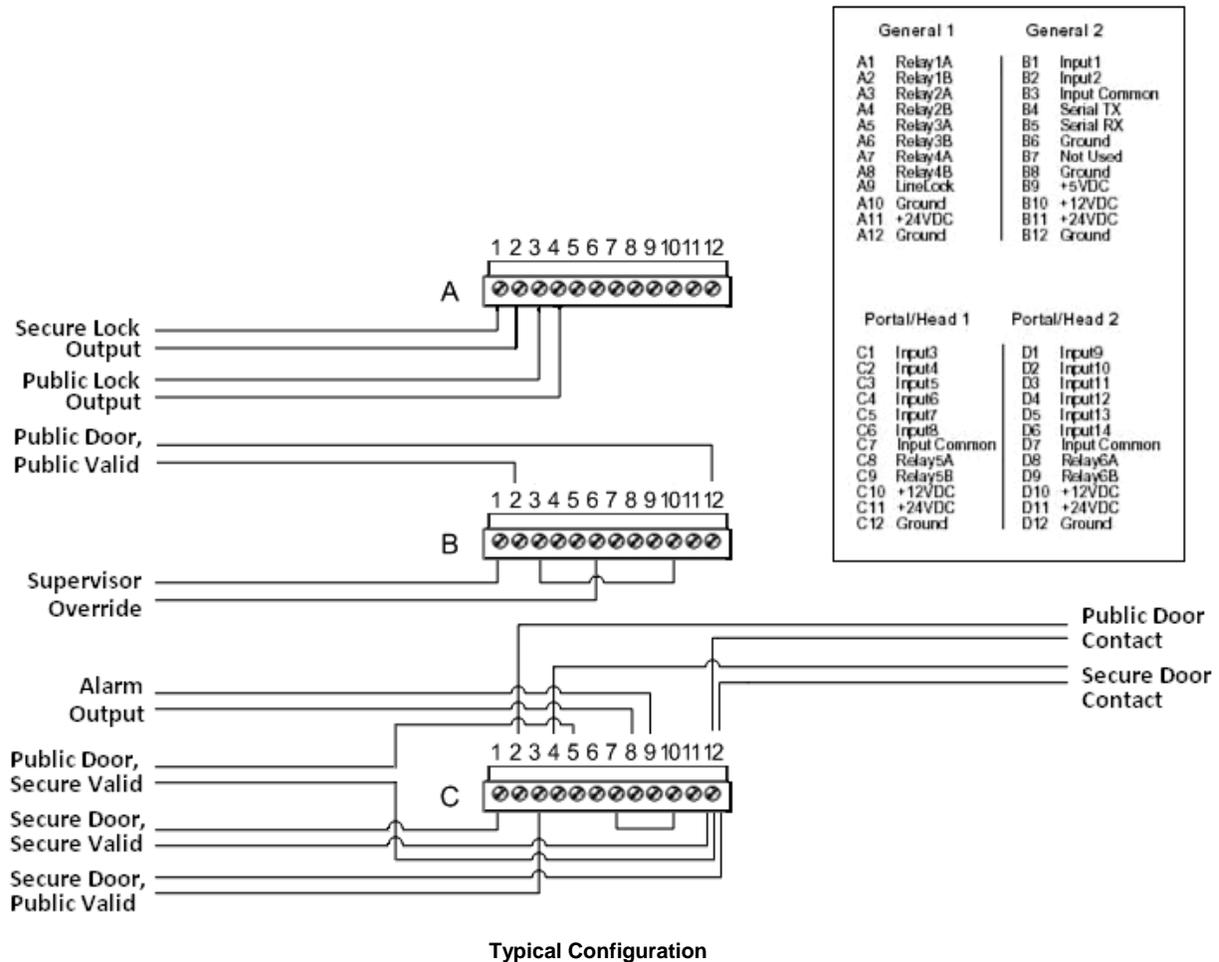
Utilizing four access control devices on the mantrap, there will be two access readers on each door. Two internal access control devices are used, one for entry and the other for egress. The access control device on the inside of the public door can be a button. The access control devices on the outside of the mantrap (each door) will allow access to the mantrap when the doors are closed and the mantrap is empty.

The Public door/Secure side access device will only allow passage through the public door if there is one person in the mantrap or the system is set as unidirectional (no detection on egress). With one person detected in the mantrap during entry, the Secure door/Public reader will allow passage through the secure door.

6. INTEGRATION WITH THE ACCESS CONTROL SYSTEM

Relay Output Connections

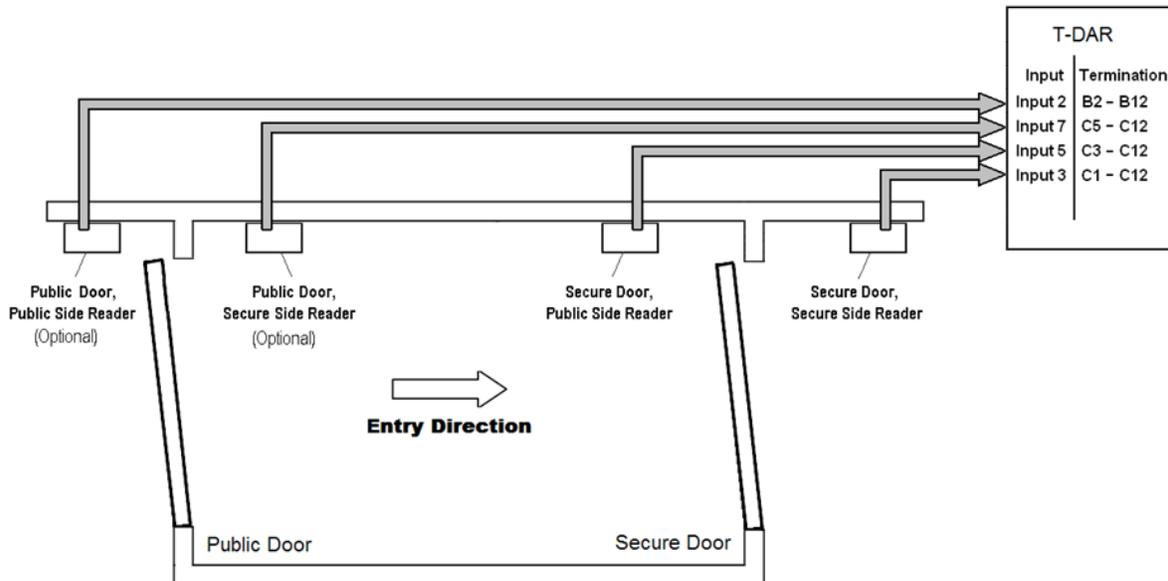
The T-DAR T-2010 control unit is equipped with four relays on the General 1 connector, plus one relay on each of the portal connectors. Use these relays to signal various alarm conditions based on user configurable options in the user interface. Relay outputs have no polarity and are dry, providing no 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 output states on relays three through six. These relays are normally open.
- The door lock relays can be configured as normally open or normally closed
- All input grounds are common to one another
- A jumper between +12VDC and Common will generate a reference voltage for all inputs

Access Readers



Door Lock Control

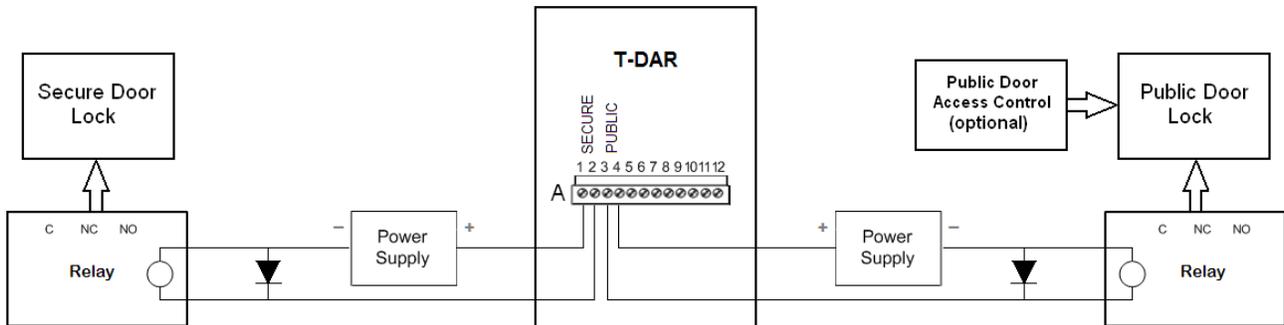
Two relays on the T-DAR unit control locking of the mantrap doors. These relays can be set normally open or normally closed. The T-DAR locking relays terminate at 1a/1b and 2a/2b on the "A" Phoenix connector.

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).

Protect 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.



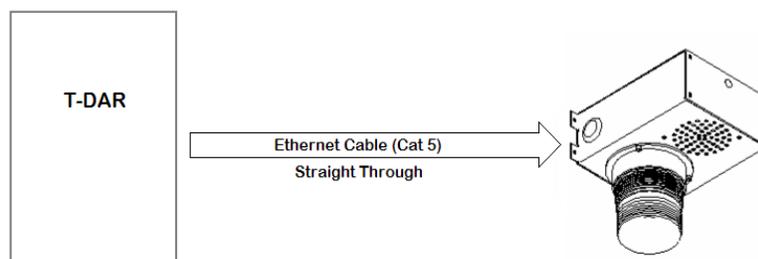
Note: there is no polarity on the T-DAR output relays.

Annunciator Unit

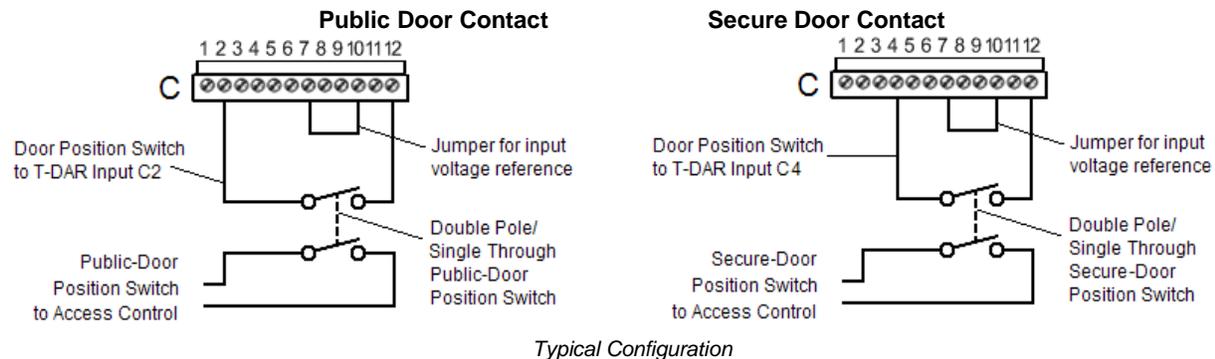
Place the Annunciator inside the mantrap to notify the occupant(s) of a violation.

- 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' port 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 CAT5 cable using a network cable tester, (unplug the cable from the T-DAR before testing).
- The Annunciator unit should be installed less than 61m (200ft) from the control unit.

WARNING: plugging in a camera head (CAT5 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 should 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. In addition, improperly mounted door contacts or access programming delays may allow doors to open without a valid access grant.

- There can be no noticeable latency in the receipt of door switch signals by T-DAR.
- The door position switch will connect to the Door Contact terminal and ground.
- Ensure that the distance from the control unit to the door contact switch is less than 60m (200 ft). 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 (bypass)

The supervisor override is an input that allows multiple persons and objects to pass through the mantrap without alarming or preventing passage. With supervisor override enabled, the T-DAR will not unlock any doors. Reader access is required during override.

- T-DAR override is typically operated by a remote button, or as a key switch near the mantrap.
- While holding the override signal, the strobe will continue to flash on the Annunciator.
- Supervisor override is input 1, which corresponds to B1 on the front T-DAR panel.
- Holding the supervisor override switch will halt all Annunciator statements until the override signal ceases.
- Normal validation of mantrap readers is required for passage through the mantrap using supervisor override.
- If the end user requires that both doors open at the same time (e.g. during an emergency), external wiring or programming must be used to bypass the T-DAR locking output.
- To stop presently running Annunciator alarms and put the mantrap in a reset state, provide a momentary override signal to the T-DAR controller.
- Hold the supervisor override signal continuously to turn off tracking for one complete passage.

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 a disk included with the T-DAR system. The Control Unit software is preloaded on the T-DAR control unit and does not need to be loaded from the disk.

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.

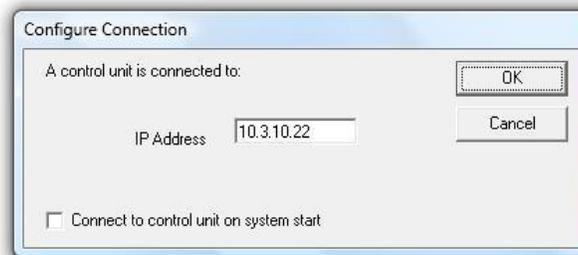
4. Enter the following information according to the IP on the T-DAR door:
IP: 10.3.10.x (use a number, one higher; if x is 51, use 52)
Subnet: 255.0.0.0
Gateway 10.0.0.1 (this may be left blank)
5. Apply these changes and return to the desktop. You may have to reboot your host computer before the changes 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.

Configure Connection Window



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. Run 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 latest T-DAR mantrap user interface software
- A video monitor or VGA monitor with associated cabling
- The camera calibration CD's, included 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 T-DAR 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 images are missing, or if any of the signals are rolling or 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 adjust the T-DAR parameters.

Viewing Images

Select the Show Camera Views view from the monitor page. This will show a "four image" display on the CCTV (or VGA) monitor showing the tracking image, event camera video, and tracking camera views 'a' (1) and 'b' (2) from a single camera head. Using this image, the installer is able see what the system is viewing in real time. The upper left portion of the screen will show the stereo tracking image from the camera head. From the drop-down menu, there is an option of displaying images from the secure door or the public door. Using this display, the installer is able see what the system is viewing in real time (a real time view is not available in the user interface).

Calibration

After the mantrap construction is complete and the environment is finalized, 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 calibration, separately.
- Remove objects that are not normally in the mantrap such as carts, parcels, tools, etc. during calibration.
- Be sure that the doors are closed and that the lights are on during calibration.

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

Testing the Mantraps

Test the units periodically to ensure that they are 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 be generated. The Annunciator warning (spoken) should say, "Only one person at a time allowed through door". If the system does not operate correctly, verify that all access readers and door contacts are sending the proper signals to T-DAR. Monitor the inputs and outputs on the video output screen. To view the I/O select "I/O Display" from Monitor tab of the user interface.

Check that the system is calibrated by viewing the tracking image for both camera heads. Monitor the tracking view on the upper left of the video output. The tracking view should be almost entirely black. The tracking view is accessible by going to the Monitor tab of the user interface and selecting show camera views. If the image is not black, calibrate the camera head. Check the two raw video images on the lower half of the monitor. Both images should be completely stable with no distortion. Watch the video screens for roughly ten seconds and ensure that the images do not shift vertically.

Check both camera heads by using the drop down menu. If the system still does not operate correctly, refer to the troubleshooting section of the manual or call Newton Security or your integrator for additional support.

Capturing Events on Video

T-DAR can capture and play back event video by connecting an optional security camera.

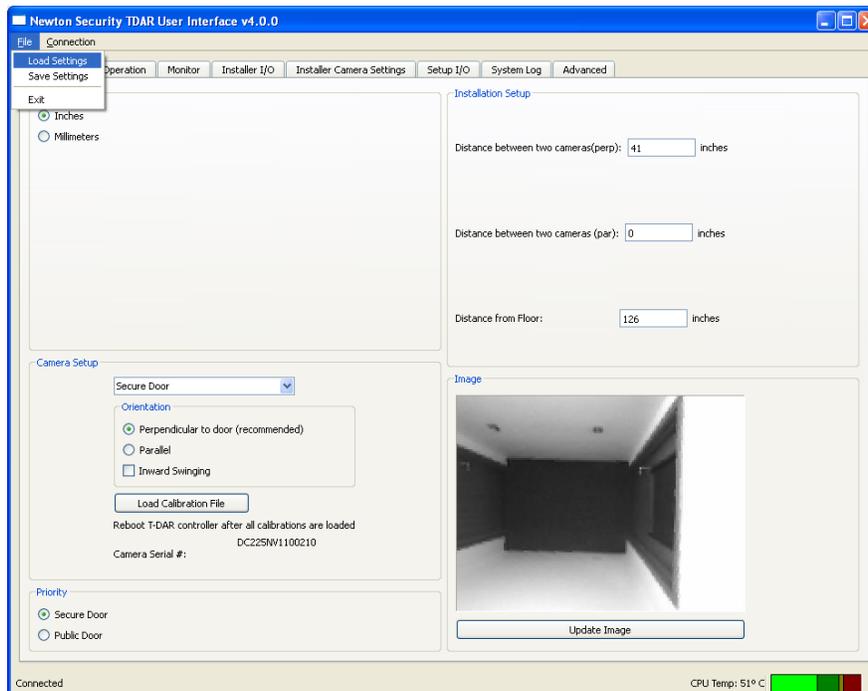
- The video start and stop times can be set, relative to the time of a violation.
- Upon a violation or alarm event, the T-DAR system records the occurrence and immediately outputs the video from the BNC or VGA video port.
- The T-DAR system does not store event video.
- Use an external DVR system when permanent storage of event video is required.

T-Dar User Interface Software

The T-DAR User Interface (UI) software consists of eight tabbed pages labeled as follows; Initial Set-up, Operation, Monitor, Installer I/O, Installer Camera Settings, Setup I/O, System Log, and Advanced. On the tabbed pages, there are settings to 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 the File menu displays options for saving and restoring settings. When saving, store settings in a secure location with the name of the mantrap (be sure settings are easily locatable). In the event of having to re-install the software, restore 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. The saved file will have 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, with the latest settings designated. Create user-defined logical names for the file, such as "East Mantrap.nlic" to avoid confusion. If possible, save the latest settings to a disk and keep it with the installation disks, inside the door of the T-DAR unit.

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 proper location and load the desired file. Save the latest settings to a disk and store it with the installation disks, inside the door of the T-DAR unit.

Exit

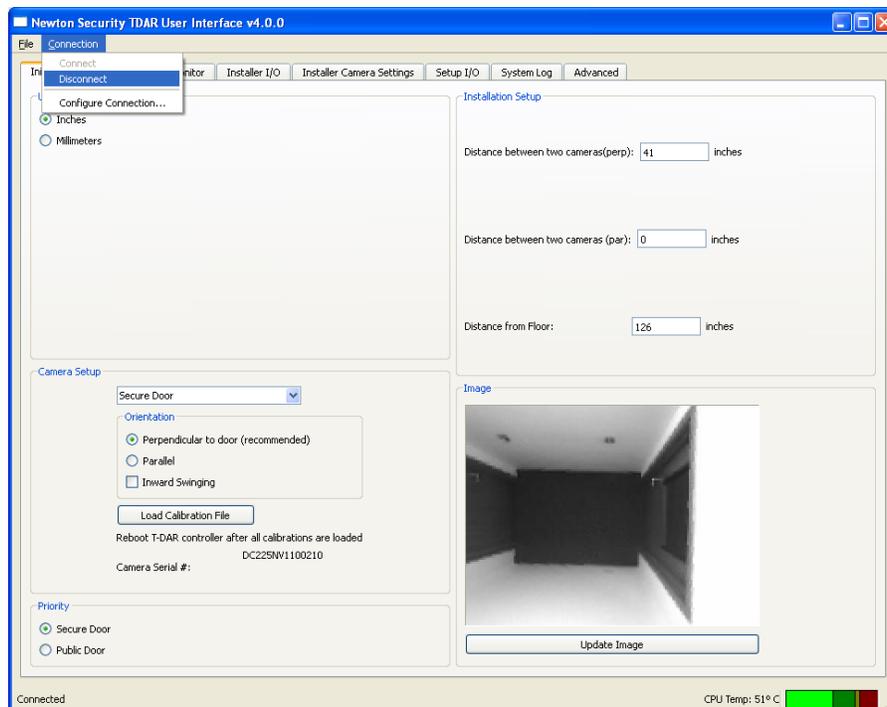
Clicking the Exit button closes the User Interface. The T-DAR will continue operate, even with the user interface disabled. Adjusted settings will persist on the T-DAR control unit after disconnecting. The T-DAR control unit does not require a connection with the host computer under normal operation.

Note: The "Save Settings" and "Update Now" commands do not save (or send) settings to the T-DAR control unit. The T-DAR continually saves any changes made in the user interface.

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

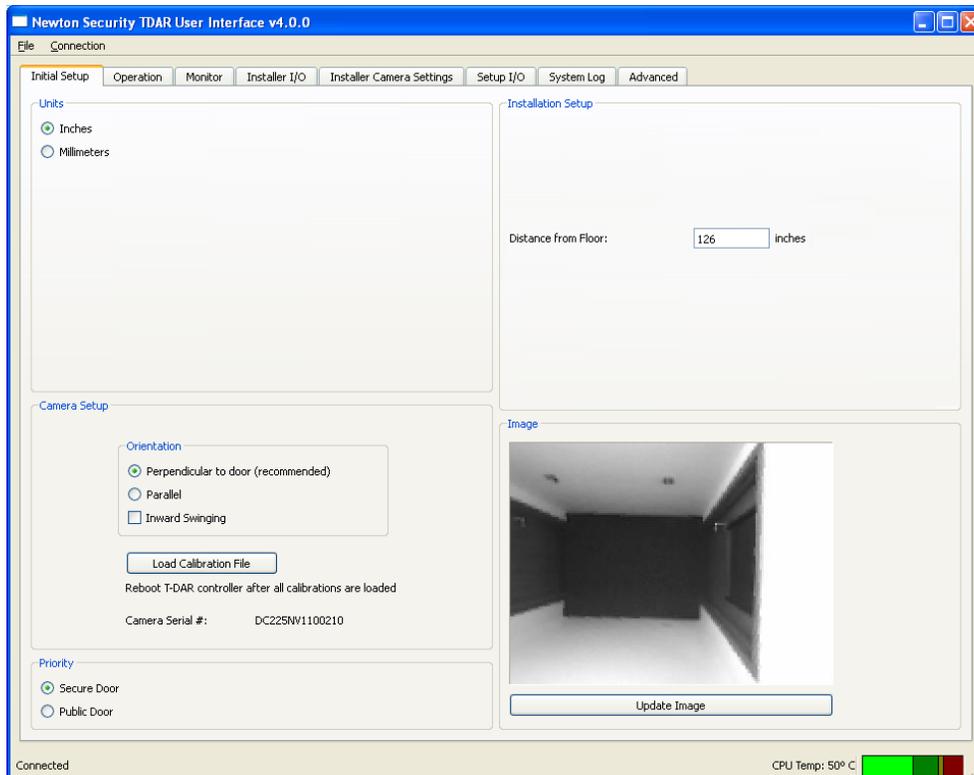
The Debug menu is a normally hidden menu item showing some advanced features. Press CNTR+SHFT+D to display. The Debug menu is not for general use, but designed for use by the system administrator to troubleshoot or make changes to the system. Without proper training, seek assistance before making changes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

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

Initial Setup

The initial Set-up tab is the place to begin the setup process. The initial setup tab contains fields for setting the camera positions as well as a button for installing the camera calibration files.

Note: You will not be able to move to other tabs in the UI (to complete the setup) until a proper camera position and serial number has been loaded.



Camera Set-Up

In this tab the technician inputs the distance of the camera heads from the floor, the separations between heads, and loads the camera calibration file. It will be necessary to check that the camera calibrations (serial numbers) in the user interface match the camera serial numbers in the ceiling. Load the calibration file by clicking “Load Calibration File”. Locate the calibration file on a disk included with each T-DAR camera package. Open the camera directory and select “calib.ini”. Remember to re-load the calibration file if and when a camera head is swapped with a new head.

Note: A re-boot of the T-DAR controller is necessary for a new calibration file to take effect.

With the camera heads mounted parallel, set ‘Distance between two cameras (par)’. The camera heads should be mounted in a line along the central axis of the mantrap, unless there are limitations in space. See the mantrap diagram in the section “Stereo Camera Heads.”

Loading Camera Calibrations

Each stereo camera comes with a specific calibration file, which must be loaded onto the T-DAR control unit before the mantrap is put into use. A CD is shipped with each stereo camera containing the calibration file for that specific camera head. Before a stereo camera will track correctly, the calibration file must be loaded.

To load a camera calibration, connect with the user interface and open the “Initial Setup” tab. Click on the button labeled “Load Calibration File”, then locate the calibration file from the included disk and select it. After loading the calibration file, reboot the T-DAR controller. Note that loading a camera’s calibration file is a different step than calibrating a camera, which is described in the section Installer Camera Settings.

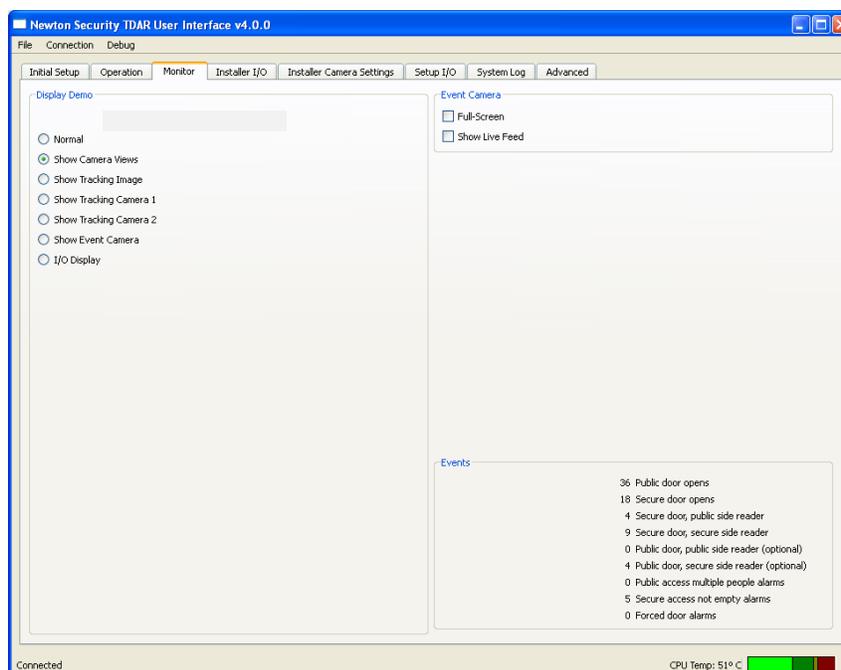
Note: Pressing “Update Now” will refresh the image only; it will not save or update any settings.

Video Modes

This feature does not exist on T-DAR units built after 2011. Setting the video mode allowed the user to change the standard of the video output to NTSC or PAL. New units have NTSC or PAL mode 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.

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.



Display Demo

The Display section of this screen controls what video is shown on the monitor.

- **Normal** - Event video out during alarm only
- **Show Camera Views** - Four way split screen - 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** - Event Camera video
- **Show I/O** – Displays the input and output status

Events Counter

The Event Counter is a running log of the security scenarios being monitored by the T-DAR. Included events are access grants, door cycles, and security violations.

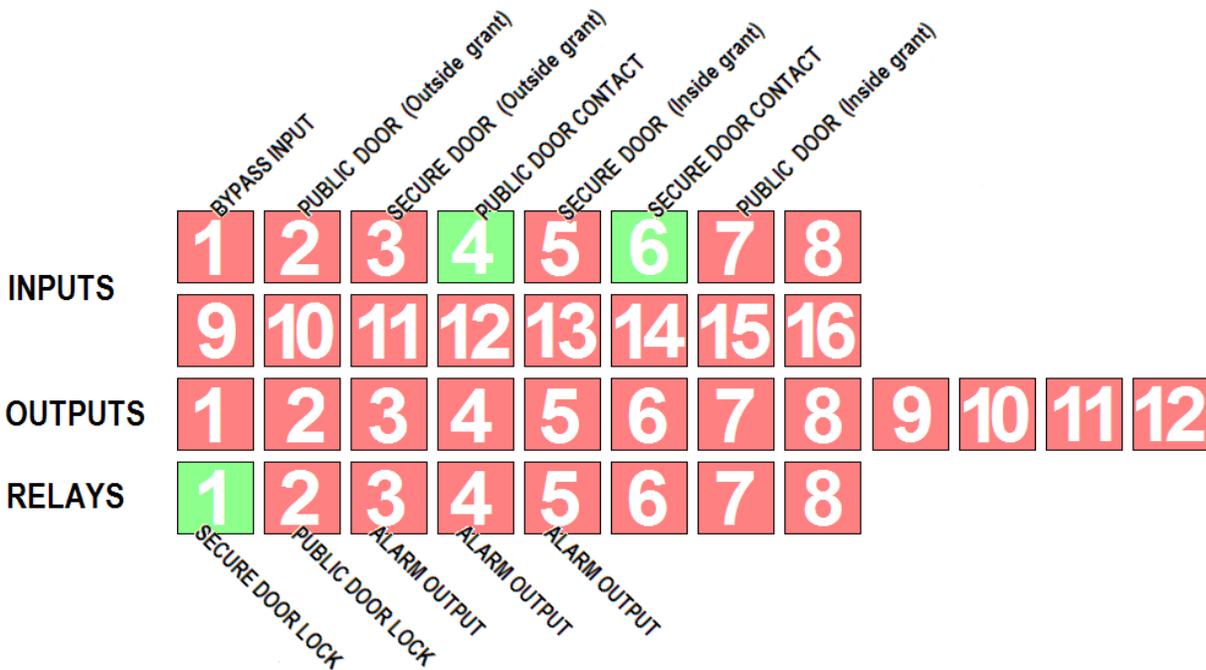
Event Camera

Two check boxes are available for changing the properties of the event camera view in the normal display mode. Full screen mode allows the user to select a full sized image for event video display. Show Live Feed mode allows the user to display live video from the event camera until an alarm occurs, at which time the event playback will occur. Once event playback is complete, the image will return to a live format. Unselecting this feature will cause the screen to be blank until a violation occurs.

Note: Once event playback of the violation is complete, the internal video recording is no longer stored. Event video cannot be retrieved at a later time. Newton Security recommends the use of an external DVR system if permanent storage of event video is required.

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. This is a helpful feature for troubleshooting. Use the input/output status during the T-DAR installation. 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

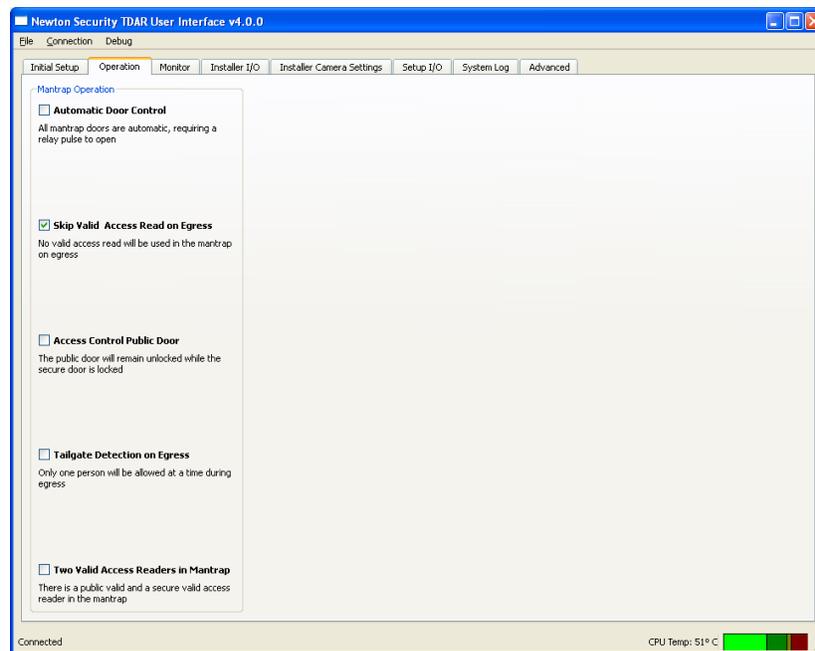
The T-DAR system communicates to access control through dry contact relay outputs. Green squares on the bottom row of the IO display, represent relays that are closed. There are two door lock relays (1 and 2) as well as four alarm output relays, 3, 4, 5, and 6. The output state of the door lock relays can be set to close-to-lock door, or open-to-lock door. To invert an output relay, change the door control setting on the Installer IO tab from opens to lock, or closes to lock. The T-DAR system does not use any of the optically isolated outputs 1-12. Use relays 3, 4, 5, and 6 for status or alarm outputs, such as “mantrap in use”, “mantrap occupied”, or “multiple people in mantrap”.

Inputs

The status of the inputs, such as door contacts and access signals, allow the T-DAR mantrap to operate correctly. The mantrap will not function correctly if the inputs do not signal correctly. A green state on inputs 4 or 6 will always represent a closed public or secure door, respectively. Changing input states, from red to green, on 2, 3, 5 and 7 will represent incoming valid access signals. The normally open/closed status of the inputs is not adjustable in the T-DAR system; use an external relay to invert the input signal.

Operation

Use the Operation tab to configure how the mantrap operates. The Operation tab provides various settings for direction control, number of readers, and operation during egress.



Automatic Door Control

The T-DAR can provide control of automatic doors. Using automatic door control, the T-DAR system will provide outputs to open the public or secure door. This feature requires both an automatic public door and an automatic secure door.

To open an automatic door, the T-DAR provides a momentary signal. This signal will cease once the door opens. The output signal from the T-DAR is a dry contact relay. When opening a door, the T-DAR relay will close (or open), signaling the door to open. Once the door opens, the relay will return to its original state.

Skip Valid Access Read on Egress

In some mantrap systems, a valid access read will be required on egress. Bidirectional tracking mantraps will sometimes use an additional access reader on the inside of the mantrap to open the public door during egress. If there is one access reader in the mantrap, use this for validation in both directions. If there are two access readers in the mantrap, use the reader near the public door for accessing the public door on egress.

Select "Skip Valid Access Read on Egress" when not using an access reader inside the mantrap during egress. When not using a reader for egress, a person will enter into the mantrap and as the secure door closes, the T-DAR system will unlock the public door without requiring an access read.

Access Control Public Door

In some mantraps, the public door will remain access controlled. When time is a factor and high throughput is required, the mantrap may be setup with no access control on the public door. When the public door is not access controlled, the T-DAR system will continue to interlock both doors. Having a public door that remains unlocked is one method to increase mantrap throughput.

With "Access Control Public Door" turned off, the public door remains unlocked while the mantrap is not in use. This allows persons to quickly enter the mantrap without receiving a valid access grant on the public door. The public door will lock when required, when the secure reader is accessed or the secure door is open. Once the mantrap resets itself, the public door will unlock. With automatic door control enabled, the public door will always require an access device on both sides of the door (typically a button on the secure side).

Tailgate Detection on Egress

A mantrap with bidirectional tailgate detection will stop tailgating during egress (as well as entry). A mantrap with bi-directional tailgate detection may utilize the same access control hardware as a mantrap with single direction tailgate detection, such as door locks, door contacts, and access readers.

To permanently allow egress of multiple people at one time, turn off "Tailgate Detection on Egress". With "Tailgate Detection on Egress" unselected, there will be no alarming on egress, unless there is an entry (into the mantrap) through the public door. When the public door is open, the system will alarm on potential crawlers or low objects coming into the mantrap through the public door. Until the mantrap resets, there will be no alarming while the public door is open and two people enter.

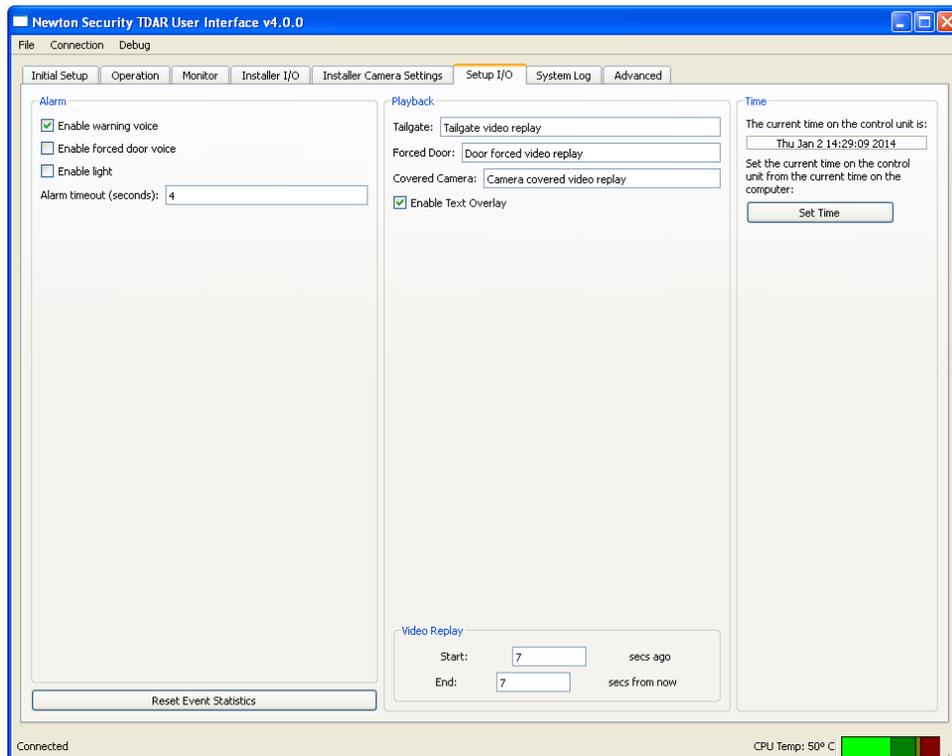
Two Access Readers in Mantrap

Utilize one or two access readers in the mantrap. With one access reader selected, use the same reader in the entry direction, as in the egress direction. Another method of operation using one reader is to access the reader only on entry and skip the reader on egress. Skipping the reader on egress is a common method in a uni-directional mantrap, as the T-DAR performs no tailgate detection in this direction. Mantraps set up to use only one internal reader may have an internal button for use on egress. Use the internal button to unlock the public door or to open the public door if it is automatic. Use an internal button so that a person without valid credentials may exit the mantrap at any time. The occupant will leave through whichever door they entered.

With two access readers enabled, use the reader near the secure door for entry and the reader near the public door for egress. With two internal readers, the mantrap will have symmetric operation in both directions, so the method of entry will be the same as the method of egress. Only bi-directional mantraps require two access readers inside the mantrap. A uni-directional mantrap does not perform tailgate detection on egress and therefore does not require a second internal access reader for egress. Place a button inside a mantrap with only access readers, so that a person without valid credentials cannot be locked inside the mantrap. The T-DAR system cannot accommodate two access readers and a button. When a button is required along with two internal readers, wire the button independent of the T-DAR system, to open the appropriate door.

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 announcements provided by the Annunciator. In addition, an Alarm Timeout box 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.

Playback

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 internal time of the T-DAR controller. Clicking the Set Time button will set the time on the control unit to that of the PC running the User Interface. Perform corrections for the beginning or ending of Daylight Savings Time manually.

Reset Event Statistics

Use Reset Event Statistics to reset the Event counter, located on the Monitor page.

Installer Camera Settings

The Installer Camera Settings screen consists of a pull-down menu, 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 (a), Secure 2 (b), Public 1 (a), and Public 2 (b) may be shown individually.

Image

Use the Image Type section to select views shown in the image at the bottom left of the user interface. Use the dropdown menu to select which camera head is to be modified. The settings for each camera head are independent. A red box may be shown in the image that outlines the scan area that the T-DAR uses for tracking. The T-DAR system ignores the areas outside the scan regions. The Viewing Window allows for modification of the scan regions by clicking and dragging directly in the image. The scan zones may also be moved by adjusting the Left, Top, Right, and Bottom fields in the Configuration section.

To draw a region (red box) in the Viewing Window, the image displayed must be one of the two un-warped images (in the Image type section). Use un-warped image “1” or “2”, as they are similar. Position the mouse pointer over the top left corner of the area around which you would like to draw the box. Click and hold the left mouse button and drag the pointer to the location that sets the “red box” to the appropriate size and position. 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 or enter zeros in the Configuration section.

Note: When referencing the image, be sure to update the image. Update the image by clicking on “Update Now”. Update Image does not update any settings, only the Image.

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

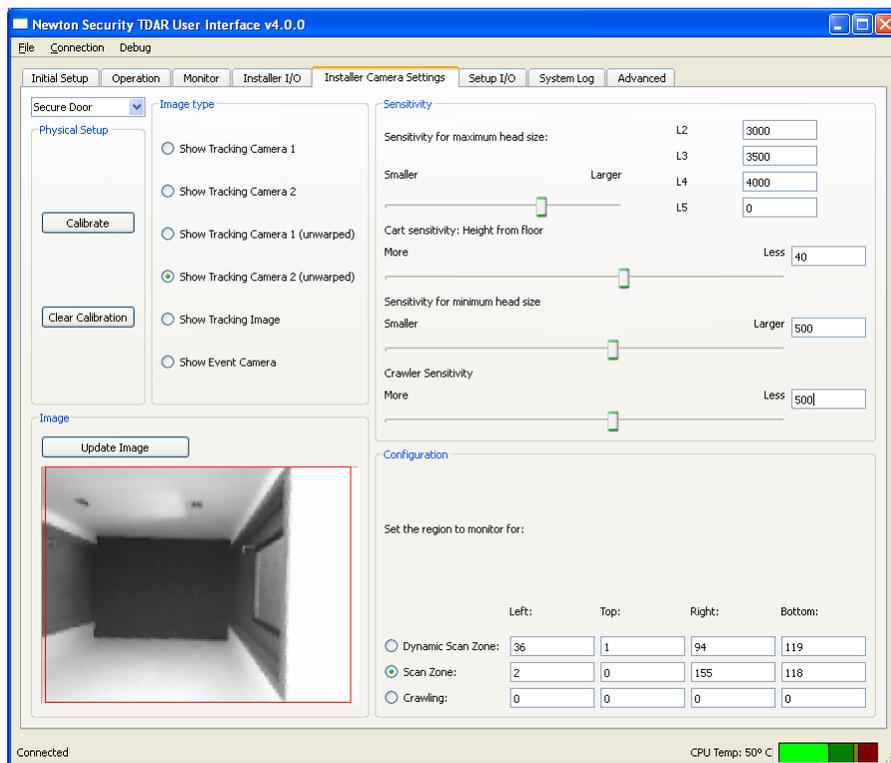
Update the image by clicking on “Update Now”. The update now button updates the image in the Viewing Window. Updating affects the viewing window only, no settings are updated. Ensure that the image is current each time the picture is referenced.

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. The scan areas can be seen by selecting the Scan Zone radio button (in the Configuration section) and selecting “Show Tracking Camera 2 (unwarped)” (in the Image Type section). Select the appropriate camera head from the dropdown menu (above the “Physical Setup” section). Click “Update Image” 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, that the headcount remains one. The headcount is displayed on the video output screen. When switching between the secure camera head and the public camera head, you may need to update the image each time by pressing “Update Image”.

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.

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

- 1) The edge of the Scan Zone for the public 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 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.

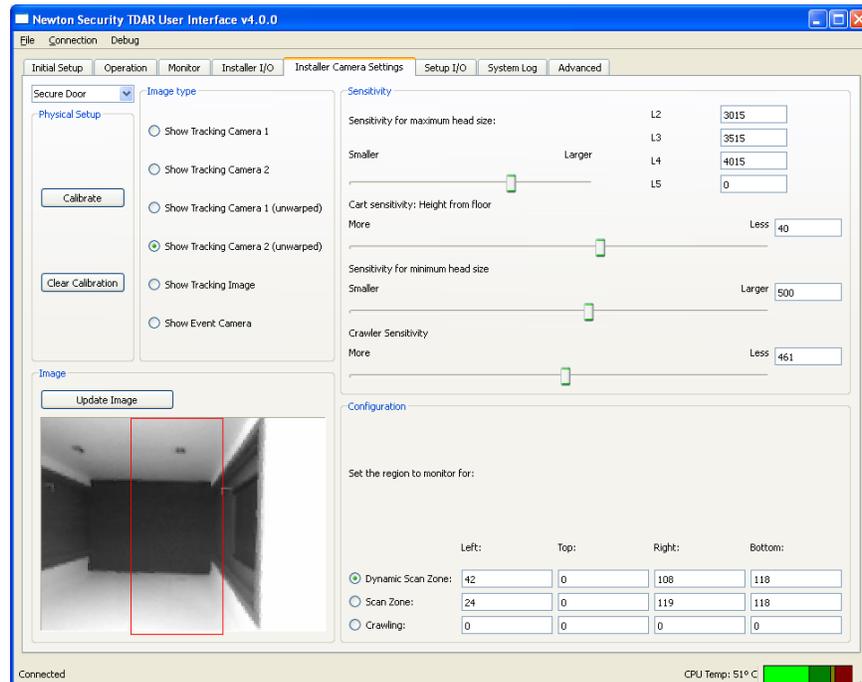
Dynamic Scan Zone

The purpose of the dynamic scan is to detect a person tailgating through the public or secure door. The Dynamic Zone detects tailgating immediately, whereas the Scan Zone detects only after a person’s final access read (inside mantrap). Dynamic Scanning is a continuous scan that only occurs while the public or secure door is open. The dynamic scan occurs once per transaction/passage and continues until the public and secure doors are closed.

When the public or secure door is open and multiple people walk into the dynamic scan zone, an alarm will occur. When the alarm occurs, a recorded voice announces *“Only one person at a time allowed through door”* and the T-DAR sends a remote signal notifying security that two people have entered the mantrap. If the door remains open, dynamic scanning will continue indefinitely. Once the door closes, the system does not use dynamic scanning for the remainder of the transaction. If no Dynamic Scan Zone (red rectangle) is drawn in the image, dynamic scanning will be turned off and no alarming will occur while the doors(s) are open.

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 (un-warped)” (or the un-warped camera 1). Select the appropriate camera head, from the dropdown menu above the “Image Type” section. Click “Update Now” to update the Viewing Window.



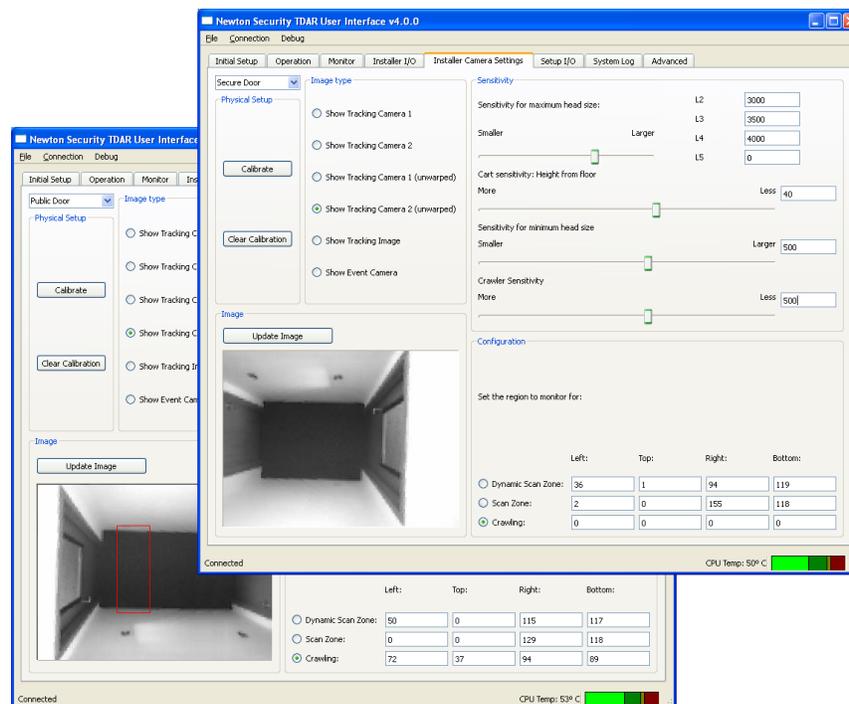
The dynamic regions are more sensitive than the scan zone regions, because of their longer scanning time. The dynamic scanning regions should be set smaller than the scan regions. Set the dynamic regions small enough to avoid moving objects, such as the public door.

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.

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 environment is completely stable. The environment 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

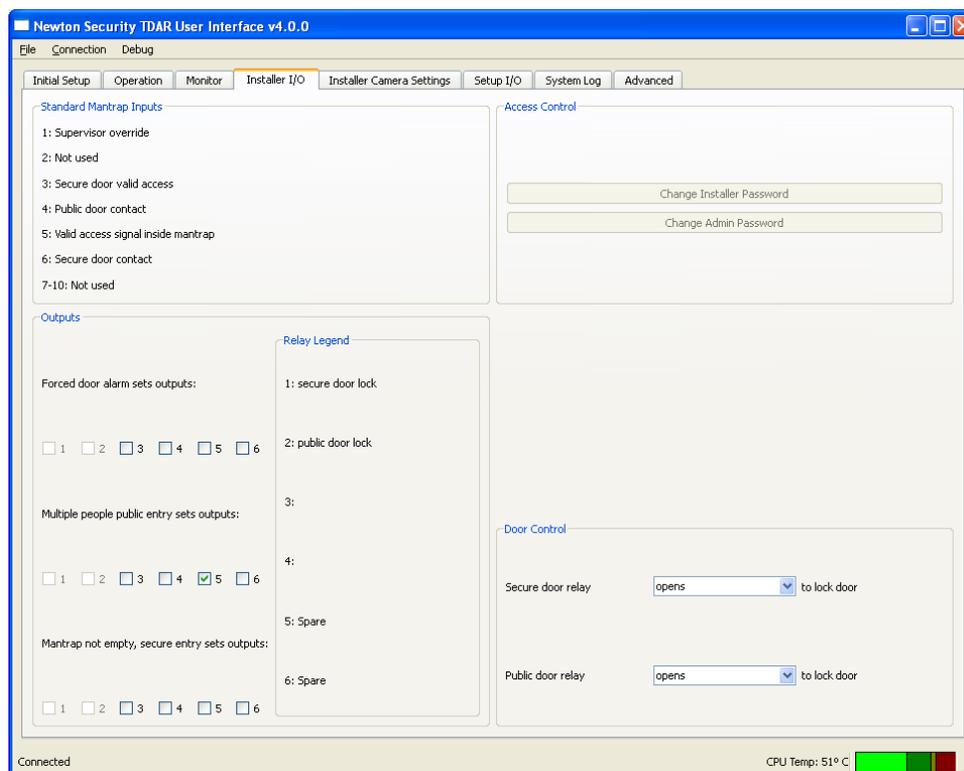
The crawler sensitivity controls the value that determines the size a specific object must be larger than to be called a crawler (crawling person). An object will be considered a crawler when:

- 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.
6. 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

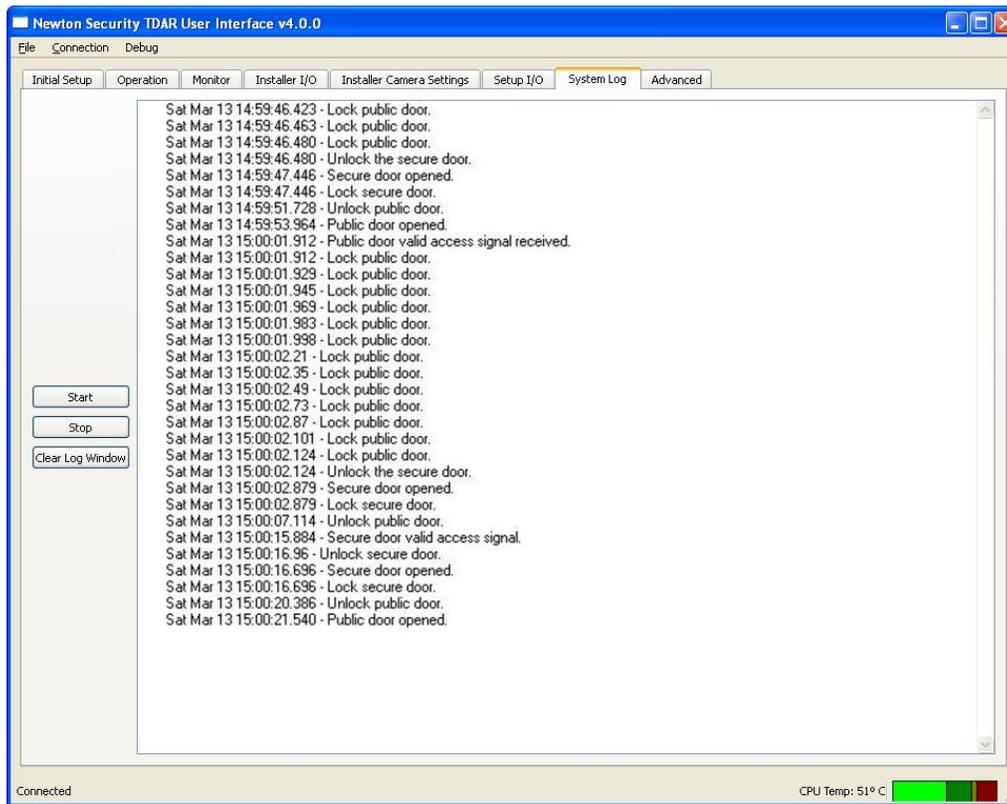
There are six relays on a CB-210 control unit for connecting signals from the T-DAR. The first relay is for the secure door lock, Relay 1A and Relay 1B. The second relay is for the public door lock, Relay 2A and Relay 2B. Relays four through six are for the tailgate alarm and forced door alarm. Activating 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.

System Log

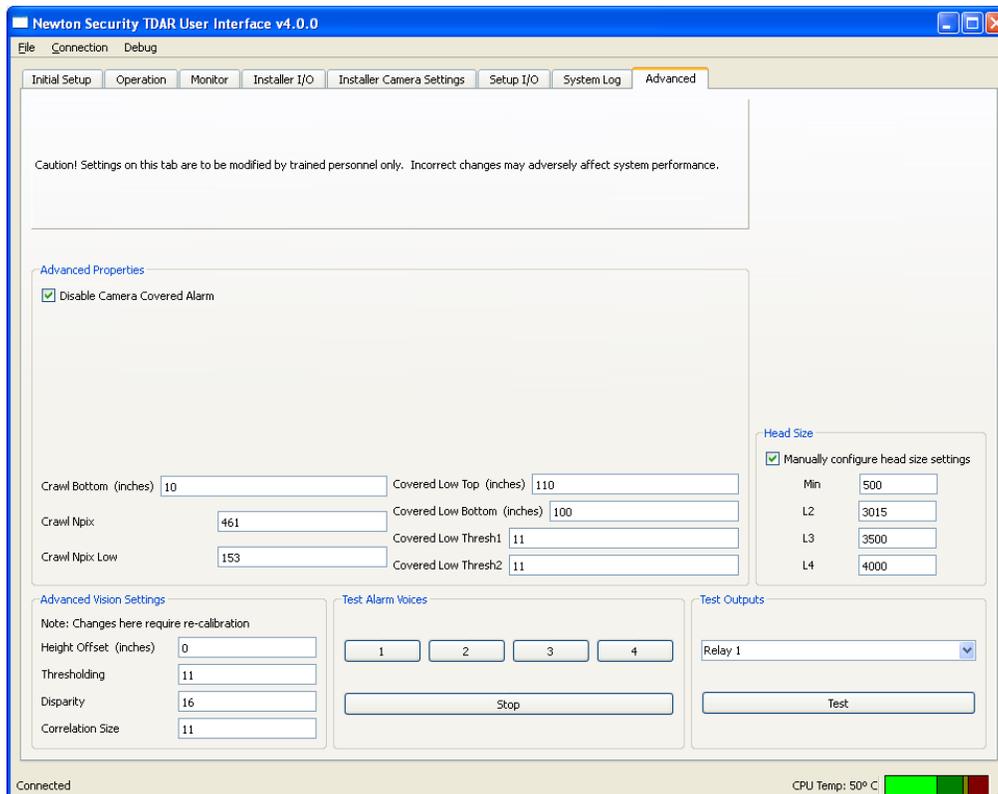
This tab allows you to see the activity of the system, when doors open and close, what alarms have been active and what inputs and outputs have been triggered.



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.



Test Outputs

Use the Test Outputs portion of the Advance tab to test the communication between T-DAR and the access control system. Choose the desired relay from the drop down menu and press the Test button. Test relays one and two to lock the doors. If the system is setup to control automatic doors, test that the public and secure door will open, by engaging relays one and two. Test the alarm and status output relays that are use. For each alarm or status signal utilized, engage the relay and ensure the access control system receives this signal.

Test Alarm Voices

Use the Test Alarm Voices portion of the Advanced tab to test the Annunciator. There are four test buttons, to control the various Annunciator alarms. Button 1 will engage the strobe light on the Annunciator. Buttons two through four will sound pre-recorded voices from the Annunciator.

Note: It is possible to change the recordings on the Annunciator using the built in microphone.

9. T-DAR Mantrap Maintenance

A maintenance procedure should be put in place to ensure the maximum life span of the system. Performing the following checks at the prescribed times will allow the system to provide a more secure access control. A system that is calibrated and running correctly will give few false alarms. Consider purchasing a spare T-DAR unit to reduce the amount of down time during a failure.

While the T-DAR system does require a general maintenance plan, it is a solid state system so does not need the type maintenance that a mechanical system requires. Besides the fans, the T-DAR system does not have any moving parts. **The fans will last for several years, provided the environment is clean and there are no obstructions to the airflow. Be sure that there is a six inch gap between the sides of the T-DAR unit and any surface or conduit piping.**

Do not modify the T-DAR enclosure. To ensure the longevity of the T-DAR control unit and maintain the one year manufacturer warranty, avoid modifying the controller by drilling or cutting holes. The control box is an industrial computer with very sensitive micro-chips, electrical components etc. Cutting or drilling of the metal enclosure inevitably results in metal chips and particles inside the control box. This metal debris lodges in the sensitive electrical components of the internal circuit boards. The level of vibration caused by drilling/cutting of the enclosure is not included into our factory test procedure. Normal transportation and standard installation is well within our design specification.

Calibration

Check the calibration yearly to ensure optimal tailgate detection and a low number of false alarms. The calibration should also be checked whenever there is a change in the mantrap environment. Calibrate the T-DAR system after a change in lighting, walls, floors, and especially when hanging signs or posts.

Observe several users pass through the mantrap, ensuring that there are no false alarms. Ensure that the user is able to pass completely through the mantrap on the first try. Attempt to tailgate through the mantrap. Each tailgate attempt should sound a local Annunciator and send a remote signal to security.

Fans and Temperature

Check LED 3 on the front panel of the T-DAR controller yearly, to ensure the temperature is at the proper level. A green light signifies that the unit is running in the correct temperature range. A red LED or yellow LED is an alert that the system is running hot or is about to overheat. Ensure the fans are spinning at a constant speed. Both exterior fans should be running smoothly with no unusual vibration or noise.

If there is a padded filter over the intake fan, replace the filter every six months. Note: It is normal not to have a filter over the right exhaust fan. When using padded filters in a dirty environment, replace the filters as often as necessary. The filters should be replaced if they show any amount of discoloration or darkening and well before the unit shows other signs of overheating.

Stereo Cameras

Check the integrity of the camera yearly, ensuring that the connections are secure. In order for T-DAR stereo algorithms to work correctly, the raw video from the cameras must be clean and stable. There are two cameras in each stereo head. Check the raw video output from both of these cameras on a video monitor (or VGA monitor). Ensure that the video from each camera is stable with no signs of movement. Look for signs of interference on both cameras to ensure that the video is clean with no lines, static, or warping.

Ensure that the video sync is stable. The camera video (on the monitor output) should not shift up or down. If one or both images shift up or down, by a pixel or more, check the CAT5 and coax cables running to the camera heads. In a T-DAR system with more than one head connected to the control unit, check all of the video signals from the camera heads.

Note: On T-DAR systems utilizing more than one stereo head, sync interference on one camera will often induce poor sync performance on other camera heads.

Hardware and Integration

Check the operation of the mantrap once a year to ensure that all systems are functional. The door contacts and door lock operation should be proved. All readers should be tested to ensure that users do not have trouble receiving validation. The T-DAR cameras and connections should be checked for stability. Ensure that the alarm outputs are received by security.

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 the 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.

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.

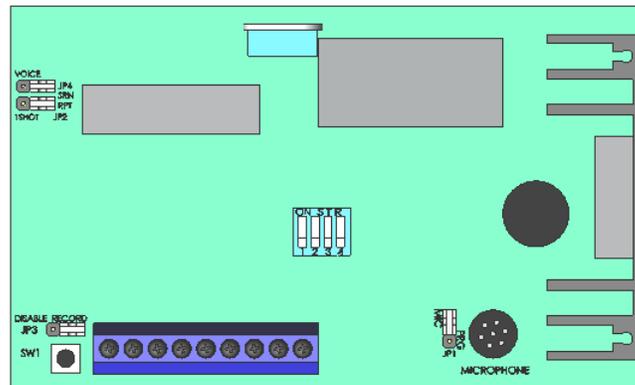
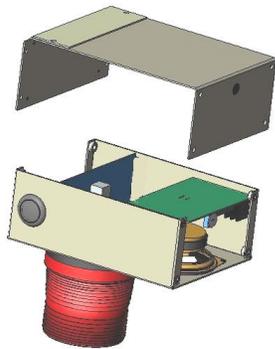
The T-DAR system requires adequate and consistent lighting for accurate operation. The T-DAR system uses stereo video analysis to determine three-dimensional characteristics of targets and requires sufficient lighting to perform this task. Equal and consistent lighting allows the system to identify and 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.

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"> ▪ Wait 30 seconds and try reconnecting. ▪ Reboot the T-DAR control unit and try reconnecting. (Note: Be sure that the T-DAR control unit is fully booted; approximately a three minute process) ▪ Check the Ethernet cable to ensure it is connected properly ▪ Ensure that an Ethernet connection is established (This is verified by a green light on LED 2) ▪ Make sure that only one copy of the user interface is installed on the laptop or PC. ▪ Ensure you are using a crossover Ethernet cable when connecting directly to a laptop or PC ▪ Make sure your Laptop or PC is set to 10.0.0. # with a sub – mask of 255.0.0.0 when connecting directly ▪ Turn off the computer, restart, and try again. <p><u>If the above suggestions do not provide results, follow the procedures below to further troubleshoot communications:</u></p> <p>Call your Newton Security Inc. Authorized Distributor</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

<p>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>	
<p><i>The Image Is Entirely Blue</i></p>	<ul style="list-style-type: none"> ▪ Make sure the BNC cable is connected properly to the Camera Head and to the Control Unit. ▪ Be sure that the camera sync cable (Cat5, straight through) is properly connected. ▪ 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. ▪ While connected with the user interface, turn to the Installer Camera Settings tab and view the appropriate camera in the Viewing Window. ▪ Connect the camera BNC directly to the monitor to check for a proper video image. Try a different cable if necessary. ▪ Contact your Newton Security Inc. Authorized Distributor.
<p><i>The Image Is Black</i></p>	<ul style="list-style-type: none"> ▪ Make sure the BNC cable and Power Control cable is properly connected to the system unit and to the Camera Head. ▪ Be sure that the camera sync cable (Cat5, straight through) is properly connected. ▪ 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. ▪ Point the Imager at a bright light. If the live image is entirely black, then contact your Newton Security Inc. Authorized Distributor.

<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>STEP 1: 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>STEP 2: 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"> ▪ Change the power source-repeat Step 2. ▪ Change the ground connections-repeat Step 2. ▪ Disconnect controllers and drives one at a time from the control panel-repeat Step 2. ▪ Physically move the T-DAR (or Camera Head cables) away from the machine-repeat Step 2. ▪ Continue with these suggestions until the source of the noise is discovered. <p>Note: 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"> ▪ Increase the overall light by increasing the intensity of the illumination source in the mantrap, or by increasing the number of illumination sources. ▪ Replace the stereo camera head if the problem persists.
<p><i>The Image Is Too Bright</i></p>	<ul style="list-style-type: none"> ▪ Decrease the illumination source or number of sources. ▪ Replace the stereo camera head if problem persists.

<p><i>The Image Is Blurry</i></p>	<p>You may need to:</p> <ul style="list-style-type: none"> ▪ 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. ▪ 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.
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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"> ▪ Observe output relay 1 on the monitor display. Ensure that it is green. ▪ 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. ▪ Open this box again and enter 'tdar3.1.locked.closed'; now again, enter the number 1. ▪ Disconnect the terminals Relay 1A and 1B. With a voltmeter check for continuity. If there is continuity check the access control wiring for correctness.

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"> ▪ 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. ▪ The public door may be open. Close the public door; the T-DAR will never let both doors open at the same time. ▪ The system may be un-calibrated. Calibrate the T-DAR system.

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 Ω
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

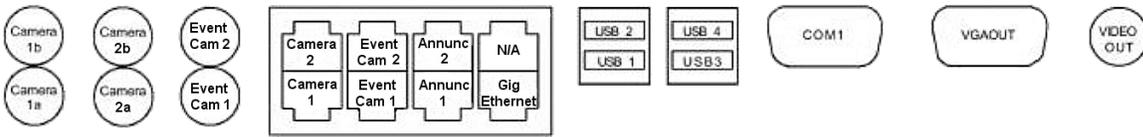
Relay Output Specifications

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 Head1, camera a. Used for secure door.
- Camera 1b:** Input, BNC connector from Stereo Camera Head 1, camera b. Used for secure door.
- Event Cam 1:** Input, BNC connector from external Camera for Event Capture
(*Event Cam 2: RJ-45 is not used for mantraps*)
- Camera 1 RJ-45:** Interface, Standard 10BaseT Cat-5 Ethernet cable to Stereo Camera Head 1 for Power/Control. Used for secure door.
- Camera 2 RJ-45:** Interface, Standard 10BaseT Cat-5 Ethernet cable to Stereo Camera Head 2 for Power/Control. Used for public door.
- Annunc 1:** RJ-45 Interface, Standard 10BaseT Cat-5 Ethernet cable to Annunciator for Power/Control.
- Annunc 2:** RJ-45 Interface, (*Not used for mantraps*)
- Gig Ethernet:** Gigabit Ethernet Interface, Standard Cat-5 Ethernet cable to Local Area Network (LAN)
- USB 1-4:** Interface, Standard USB-2 communications for flash memory, mouse, keyboard, etc.
- Com 1:** Interface, RS-232 interface for secondary communications with processor
- VGA Out:** Output, 15 pin VGA for connection of computer monitor for local system control.
- Video Out:** 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 to 14

Not Used