

***As installed in an Isotec  
Automated Security Portal***



### General Introduction & Description

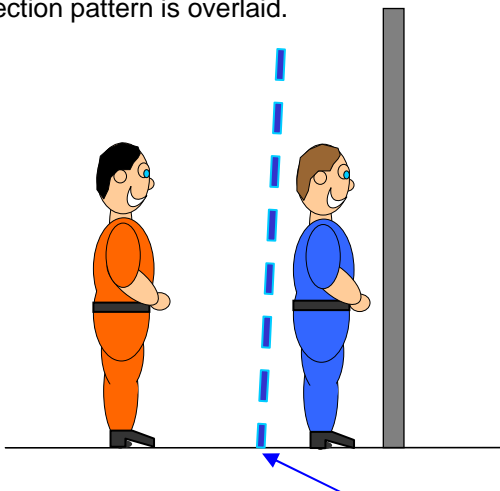
The ATG-100 Anti-Tailgating system (ATG) is a tailgating detection system that provides indication, alarm, and control of multiple individuals entering or attempting to enter a secure area. It is designed to operate as an integrated subsystem along with the other logic of an Isotec Security Access Control Portal.

The ATG is based on sophisticated video image processing technology and proprietary software algorithms, and unlike other tailgating detection systems, is designed to be insensitive to extraneous ambient lighting by the use of a patented infrared illumination and filtering system. The ATG is simple to configure. Because of the ability to adjust the detection zone into a complex pattern, the system is much more precise and accurate than simple optical sensors, and much more difficult to defeat.

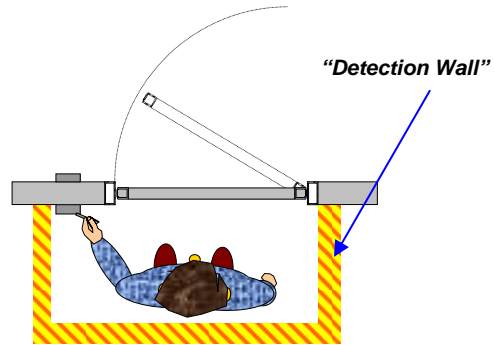
In order to prevent accidental triggering of the detection pattern due to shadows from existing lighting, the ATG incorporates a patented filtering method that minimizes the effects of ambient visible light in the field of view, and also provides its own integrated infrared illumination source.

### Operation

The ATG detects tailgating by erecting a virtual “detection wall” around an area, and sensing whenever an object penetrates this wall. The detection wall is based on real time processing of motion in a video image of the detection area, upon which a specific detection pattern is overlaid.



Representation of the “Detection Wall”



Representation of the “Detection Wall”

When an object passes thru the detection wall, the video system algorithm detects the motion. This motion detection information, in combination with the portal control system logic and the rest of the system inputs, provides accurate detection of tailgating events. In a typical installation, the ATG is used to prevent unlocking of a door if someone is detected in the sensitive pattern area, and to generate an alarm if someone enters the sensitive area if the door is unlocked.

### Physical Installation Considerations

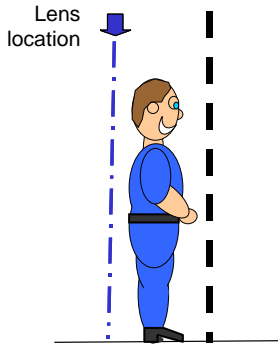
There are a number of factors that must be considered during the installation, in order to provide optimum performance. Some examples of typical installation variables and considerations are included in this section.

The ATG-100 camera system is mounted to the ceiling over the door or passage to be protected. This location is approximately 18-20 inches from the door surface. The electronics are located in the same area as the rest of the portal controller electronics, usually inside a false ceiling or other inconspicuous location.

### Camera Location Optimization

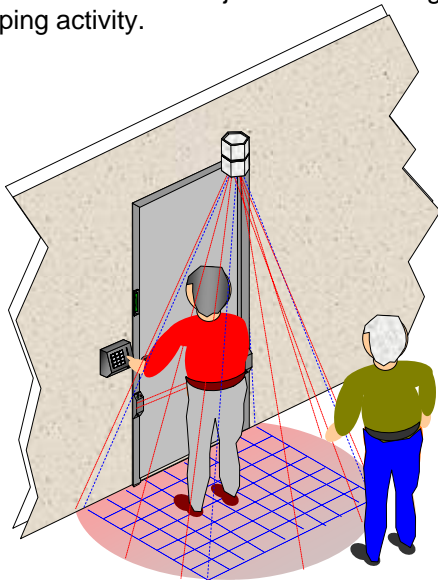
The detection lens, from which the “protection walls” emanate, is located in the Camera/Illuminator assembly, and is located over the center rear of the subject when standing in the monitored area. The spacing is about 18-20 inches from the door surface to the back of the subject; the ideal location is with the detection lens located directly over the back of the subject when inside the protection area, and the illuminator lamp oriented to the back of the subject. The goal is to have the “rear wall” of the protection

area be as vertical as possible in back of the subject.



Camera location affects rear "Detection Wall" geometry

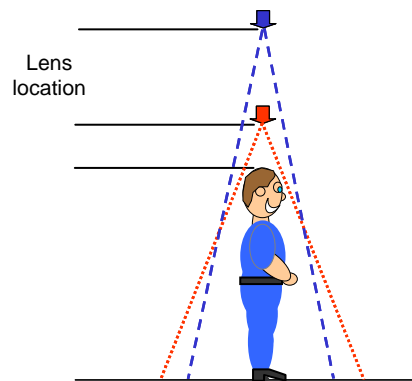
The camera is mounted near the center (side-to-side) of the monitored area, so that the side walls of the protection area are roughly symmetrical on each side of the subject. It is important to keep in mind that the detection wall is actually a pyramid shape, rather than a vertical walled box, due to the single point location of the detection camera, and this shape needs to be considered when setting up the detection pattern. If the subject will be reaching to one side to gain access, such as swiping a card on the door jamb, it may be desirable to offset the ATG camera or detection pattern slightly to that side (as shown below), so it is centered over the subject area including the swiping activity.



Offset Camera Position and Pyramidal Detection Wall

## Height & Zoom

The Camera Assembly includes a zoom lens that can be adjusted to select the extent of the viewed area in which the protection area pattern is placed. The widest zoom is used for lower mounting heights in order to cover the whole subject, and the lens can be adjusted toward the telephoto end to minimize the size of the viewed area with higher mounting. By minimizing the size of the viewed area, the detection elements cover the smallest area, maximizing the system sensitivity while still covering the area to be monitored



Effect of High and Low Mounting Location

## Illumination

The ATG 100 system includes an Infrared (IR) illumination source (the silver device) as well as visible light filtering to minimize the effects of light from existing lighting fixtures. While the filtering in the ATG is very good, it is not possible to filter out 100% of external sources. Therefore, to maximize sensitivity and minimize false alarms, it is highly recommended that existing lighting sources be evaluated and controlled in the vicinity of the protection area.

Normal fluorescent room lighting at typical office illumination levels should not cause shadow or false alarm problems. The detection system is more sensitive to incandescent lighting due to the infrared content of those type sources, and incandescent fixtures should be minimized in the vicinity of the system, or at least configured as to not cast light toward the detection area.

Sunlight contains significant IR energy, and should be eliminated in the detection area as much as possible. The system is not designed for outdoor installation. If false alarms are observed, it is typically due to shadows from external non-fluorescent light sources.

Note that the illuminator is mounted farthest from the protected door, with the camera nearer the door.

### Floor Area Considerations

Since the floor around the subject is the reference for the detection system, it is desirable to optimize this surface to provide the best performance by the system. Of most importance, the floor should be non-reflective. Carpeting is preferred to vinyl floors, for example. The floor should look a mid grey color on the monitor when illuminated by the IR source. Note that some objects that appear grey in visible light may appear dark under IR, so the proposed floor covering should be tested under the system illumination by looking at the camera output signal on a video monitor. Patterns in the flooring do not cause problems, as long as the “mid grey” condition is generally met, and for the best performance, a patterned floor provides the best protection from subjects attempting to “match” the floor image to attempt to defeat the system.

It is often useful to put an indication on the floor as to where the monitored subject should stand when being monitored. Footprints or a small square on the floor are appropriate. This does not impact the way the ATG operates, but does keep the subject in the desired location relative to the detection pattern. Since the footprint (or square) is below the subject during the monitoring, the color of these patterns is irrelevant to system operation.

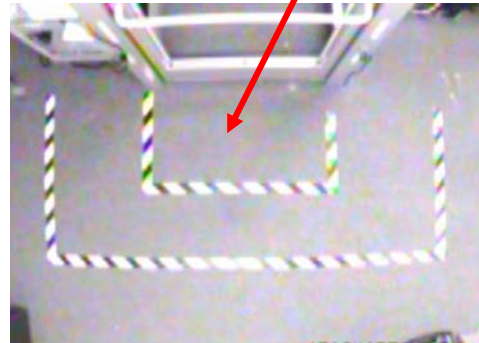
An example of a pattern found to be effective is shown below:



Photograph of floor pattern

Image of floor pattern on video monitor

“Stand-Inside” Area



While the camera and detection pattern are being set up, the image on the monitor will help in locating these barrier markings – just assure the outer barrier marking is outside the detection pattern on the screen.

### Alarms

The ATG 100 system interfaces to the portal’s electronics and displays. The typical operation is that the only system-level alarm provided is if someone crosses the detection pattern once the door is unlocked. This can occur by an actual tailgating event (someone following the person in), by the person entering stepping backward after the door unlocks, or by someone entering the portal from the outside after the first person departs. As long as detection occurs prior to

the door unlocking, the door simply would not unlock.

## Adjustment & Setup

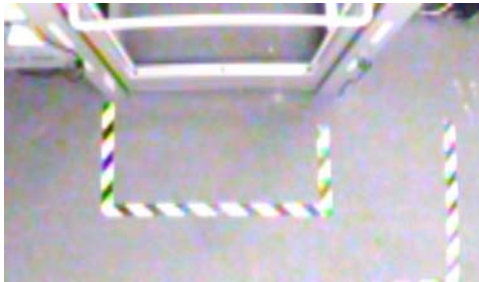
### Camera Setup

In order to adjust the camera zoom and focus, a video monitor should be connected to the VOUT (video out) terminal on the Controller Assembly. The unit is focused and adjusted at the factory, but may need final adjustment during system installation



Video Out

An image of the area below the camera should be visible on the screen, with the doorway being monitored being located at the top of the picture. Have an individual move up to the door as a reference.



Example images

If the image does not appear approximately as shown above (the pattern on the floor may not be in place), adjustment may be necessary. In order to adjust the lens, the cover must be removed with the two small screws on the side.

This will reveal the lens and adjustments. The three adjustments are shown below:

Note: it may be useful to review the section that follows on Setting the Detection pattern before making any camera adjustments, as it may be useful to see the Mask pattern before adjusting the zoom and image size.



Aperture (Brightness)

Focus

Zoom (size of field of view)

### Aperture

The Aperture of the lens is factory set at a level that will work for most installations. However, if for some reason the image is not bright enough, adjust the Aperture control to change the Brightness. In order to set the brightness, hold the lower cover upside down near the bottom of the lens. This inserts the filter into the light path to

allow proper brightness setting. Turn off any other lighting in the area, to get an accurate adjustment. Turn the Aperture ring toward Close until the image fades away (darkens), then open it until it just stops increasing in brightness. Set the aperture at this point or slightly darker than this point. Lock the set screw.

### Zoom (Image size)

Have a subject stand in the monitored location, and adjust the zoom so that there is sufficient space around the subject to lay in the protection pattern, similar to the sample pattern shown above. Note that the zoom and focus controls interact, so you will have to refocus if you adjust the zoom/image size. Also note that the zoom control has a small knob that can be turned to lock the adjustment. It comes from the factory locked. Loosen slightly to adjust the zoom then retighten.

### Focus

Since the zoom and focus controls interact, readjust the focus by putting an object about three feet from the floor and focusing on that. Focusing slightly above the floor is optimum. The focus control also has a small locking knob that needs to be loosened to set the focus.

Once the adjustments are completed, reinstall the lower cover with the two screws previously removed.

### Illuminator

Assure that the Illuminator is properly lighting the detection area. Turning off the ambient room illumination may help to see where the illuminator is shining, unless the lens cover with the filter is in place. Pointing the illuminator straight down should be sufficient.

### Detection Electronics Setup

The detection settings are preset at the factory, and should not be adjusted in the field, other than adapting the detection

pattern for the particular installation. In order to adjust the detection pattern, a PC with a serial port is needed, along with a RS232 serial cable (not a Null Modem cable) of sufficient length, and the supplied DB9-to-6pin-modular adapter. Also, a video monitor is required to view the pattern.

### Connecting the PC and Starting ManagerNet

Connect a serial cable to your computer's serial port, and the other end to the RS232 Serial Connector on the Controller unit via the adapter. The serial port should be at Com1.

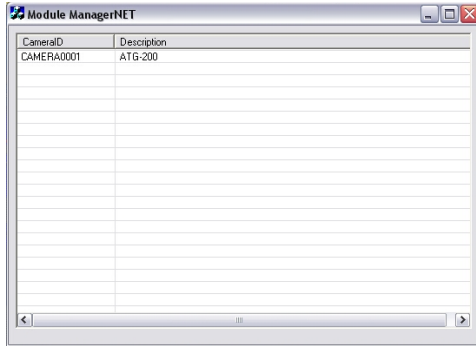


Connect Serial Cable here

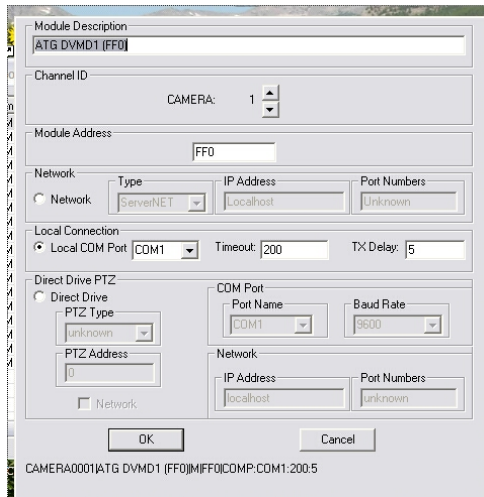
Next, find the CD shipped with the system. This contains the "ManagerNet" program as well as configuration files. Make a directory on the PC to hold these files, and copy all the files from the ManagerNet program CD into that directory.

Start the ManagerNet.exe program. You may want to create a desktop shortcut for this file for easier access.

The following Main screen or something similar should be displayed:

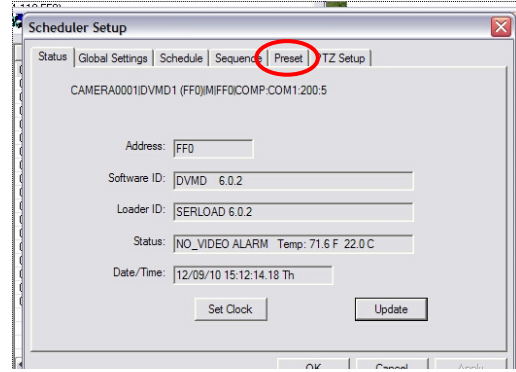


If your serial port on your computer is not at Com 1, you will have to reconfigure your port to Com 1, or change the ManagerNet to see your port. To reconfigure ManagerNet, right click on the camera0001 entry, and the following screen shows up:



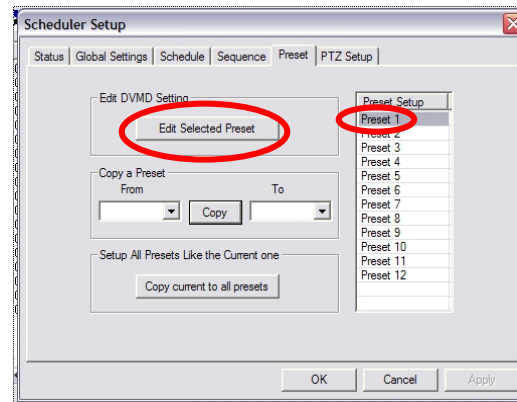
Under Local Com Port, select your serial port number and click OK.

Right click on the line showing "CAMERA0001" as shown above, (or if the screen shows other devices, select the line that says "DVMD1", or "ATG Camera"), select Edit, and the Module setup screen will appear:



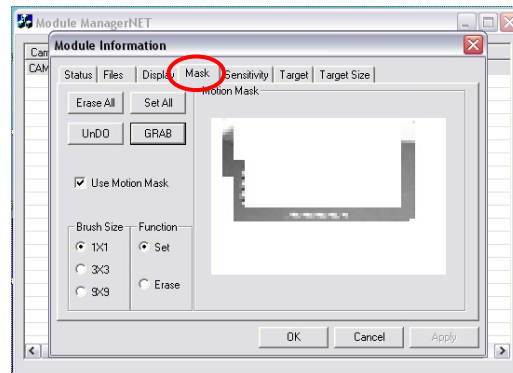
If it does not appear and you get an error message, the PC is not communicating with the ATG. Verify power is applied to the ATG (you should have a video image on the video monitor), and that the correct serial port is being used, and the cables are connected correctly.

From the screen above, select Preset to get to the next screen:

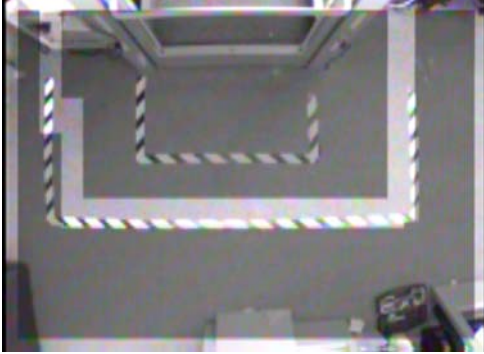


### Setting the Detection Pattern

Click on the MASK tab. The following screen, or something similar will be displayed.



When this screen is displayed, the sensitive area is also displayed on the video monitor, as follows:



On the Mask Screen, the “masked” area that is NOT white is the sensitive detection area”. (Masked means “no detection in this area”). The unit is shipped with a tentative pattern approximately as shown. The objective is to adjust this pattern so that it just encloses a single user standing at the door, inside the inner mark on the floor.

Have a user stand adjacent to the door, which will look as follows on the video monitor:



The pattern shown above allows for a somewhat larger subject to be in the area you will need to adjust the pattern so it is large enough for the largest subject, but

small enough that two subjects cannot easily fit inside the detection pattern. This will be a tradeoff of false alarms versus how tight you want the pattern to enclose the subject.

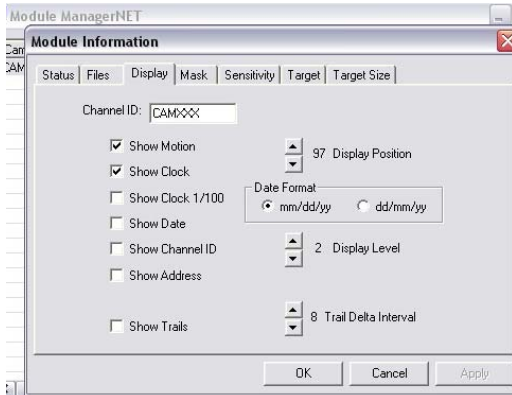
When adjusting the width of the pattern (side to side in the lane), it is important to take care that the sensitive area is either over the floor of the lane, or on a non-transparent section of wall. If the sensitive area extends into a glass area, it is possible that persons outside this lane could be detected, causing false alarms.

### Adjusting the Pattern

The detected area pattern “line width” should be about the thickness provided with the sample mask (about 6 of the smallest cell you can draw with the 1x1 pen size). Making it too large slows the response time of the ATG and delays the door opening process. Select the pen size you want to use, then select erase or set. Erase removes the masked area (ie, the part where detection does NOT occur), and the set control adds to the masked area (the insensitive area). The clear area (not white) on the mask screen is the actual detection area. Redraw the pattern as desired. Hold down the left mouse button to either set or clear the mouse location mask. Releasing the mouse button will upload the current pattern to the unit – you might note a slight delay when this occurs.

NOTE: When the Mask screen tab is displayed on ManagerNet, the detector is NOT operating normally and is not communicating with the portal electronics.

To observe the detection operation, select the Display tab, shown below. This screen allows selection of what is displayed on the Video Monitor. The “Alarm” indication on the video screen only indicates motion in the sensitive area, and does not correlate with the System Alarm output. In order to see the motion lines, the Show Motion button is selected.



At this point, detection is reenabled. Have someone move through the detection pattern area, and observe the video monitor. You will see an image similar to the following:



Motion bars and brackets will show where the system is detecting motion in the detection area. Once the subject moves inside the inner marks on the floor, the motion bars will disappear, and at this point the subject will be given a green flashing light, indicating it is ok to enter.

#### Suggested Equipment for Setup

A recommended tool or the equivalent should make the adjustment process easier. Isotec uses the Model TST 1003 Multi-Function CCTV Tester. Refer to the CCTV User's Manual for additional details.

