

AutoDome 700 Series IP PTZ Camera

Intelligent Tracking



BOSCH

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1 Guide for Demonstrating the Intelligent Tracking Feature

The AutoDome 700 Series IP PTZ camera with BVIP Firmware 5.51 utilizes the built-in Intelligent Video Analytics (IVA) to continuously follow an individual or an object. The AutoDome uses objects detected by IVA in a stationary position to activate the Intelligent Tracking feature. Intelligent Tracking controls the pan/tilt/zoom actions of the camera to keep the selected object in the scene.

The Intelligent Tracking feature shows its real intelligence when an actively tracked object is lost. Other cameras simply give up when a tracked object stops moving or is momentarily concealed by a stationary object. Intelligent Tracking uses an advanced algorithm that continuously scans the scene for a lost object and resumes tracking when the object reappears or if the camera detects motion along the same trajectory.

1.1 Necessary Equipment

The following list provides the minimum requirements for performing a successful demonstration of the Intelligent Tracking feature. In addition to the hardware and software listed below, you may need to enlist the help of a few individuals to walk or drive a vehicle through a scene to trigger the Intelligent Tracking feature.

- AutoDome 700 Series IP PTZ Camera with H.264 Firmware version 5.51
- Computer with the following:
 - Operating System: Windows XP (Service Pack 3) or Windows 7 (32 or 64 bits)
 - Processor: Intel Pentium Quad Core, 3.0 GHz or comparable
 - RAM: 2048 MB
 - Free Hard Disk Space: 10 GB
 - Video system: NVIDIA GeForce 8600 or higher display with a minimum of 16-bit color
 - Network interface: 100/1000-BaseT
- Software:
 - Microsoft Internet Explorer, version 8.0 or higher
 - DirectX 9.0c
 - MPEG-ActiveX 5.20.0045 or newer
 - Oracle Java Virtual Machine 1.6.0_26
- Appropriate mounting hardware (refer to the AutoDome 700 Series IP PTZ Datasheet and *Installation Manual* for specific hardware)

1.2 Guidelines for Implementing Intelligent Tracking

Factors such as the viewing angle and unwanted motion (from trees, for example) may interfere with Intelligent Tracking operation. Use the following recommendations to ensure smooth Intelligent Tracking operation:

- **Mount/Mounting Surface Stability**
 - Mount the camera in the most stable position. Avoid locations affected by vibrations, such as those caused by a roof-top air conditioner. These vibrations may cause complications when the camera zooms-in on a target.
 - Use the pendant arm mount, if possible. This mount option provides the most stability for the camera.
 - Use guy wires to protect against strong winds if using the parapet mount.
- **Field of View**
 - Select a location and viewing angle that allows the flow of people to move across the camera's field of view.
 - Avoid motion that moves directly towards the camera.
 - Avoid locations that attract large numbers of people, such as retail stores or intersections. Intelligent Tracking is optimized for scenes with very few moving objects.
- **Unwanted Motion**
 - Avoid neon lights, flashing lights, night time lights, and reflected light (from a window or mirror, for example). The flickering of these lights can affect the Intelligent Tracking operation.
 - Avoid motion from moving leaves/branches that present a persistent fixed motion.

1.3 Intelligent Tracking Operation

The Intelligent Tracking feature behaves in one of the following ways:

- **Camera detects an object in motion and automatically tracks the object**

User actions always take precedence over Intelligent Tracking. If the AutoDome is actively tracking an object and a user takes control, the AutoDome will attempt to track the object after a period of inactivity.
- **An IVA alarm can trigger Intelligent Tracking to track a detected object**

A rule that triggers an IVA event must be set. The following standard tasks can be set: Object in field, Crossing Line, Loitering, Condition change, Following route, Entering field, and Leaving field. Refer to the *IVA 5.51 Operation Guide* for specific information.
- **A user manually selects an object in the live image area to track**

Intelligent Tracking allows a user to click a moving object in the live image display inside the Livepage to identify an object to track.
- **Use AUX Command 78 to activate/deactivate Intelligent Tracking**

Use AUX ON 78 to enable the Intelligent Tracking Auto Mode. This command can be used in conjunction with the rules engine.

1.4 Using Intelligent Tracking

The AutoDome 700 Series IP PTZ Camera utilizes the built-in Intelligent Video Analytics (IVA) to continuously follow an individual or object even if it passes behind a Privacy Mask or a stationary object. The AutoDome uses objects detected by IVA in a stationary preset position to activate the Intelligent Tracking feature. Intelligent Tracking controls the pan/tilt/zoom actions of the camera to keep the selected object in the scene.

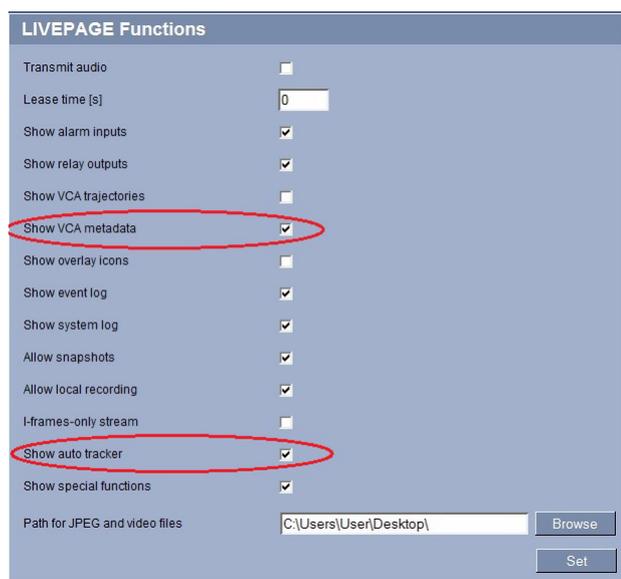
To activate the Intelligent Tracking feature, one of the following conditions must be met:

- The Silent IVA option must be selected in the VCA page on the Settings tab.
- IVA must be active for at least one preset scene in the VCA page on the Settings tab. If IVA is configured for one scene, then all other scenes have Intelligent Tracking enabled by default. If a scene, however, has Motion+ or IVA 5.5 Flow activated then Intelligent Tracker is disabled for these scenes.
- It is recommended to use the Inactivity setting to ensure that the AutoDome returns to a preset or an activity after a tracked target has gone out of the scene.

Refer to the *AutoDome 700 Series IP PTZ User's Manual* for complete instructions.

1.4.1 Setting Up for Intelligent Tracking

1. Locate a position for the camera that provides adequate movement (individuals or cars) at various zoom levels.
2. Mount the camera according to the instructions in the AutoDome 700 Series PTZ IP Installation Manual.
3. Connect the camera to a computer that meets the hardware and software requirements above. Refer to the AutoDome 700 Series PTZ IP User's Manual for connection and configuration information.
4. Launch Microsoft Internet Explorer and navigate to the URL for the AutoDome 700 Series camera.
5. Click the Settings link, located at the top of the Livepage.
6. Expand the Advanced Mode menu; then click the Livepage Function link under the Web Interface menu.
7. Ensure that the Show auto tracker option that the Show VCA metadata options are selected.



8. Click the VCA link, under the Alarm menu in the Advanced Mode.
9. Select the Silent IVA option to activate the Intelligent Tracking feature for all scenes.

1.4.2 Interacting with Intelligent Tracking

Once the AutoDome 700 is installed and configured for Intelligent Tracking, the Livepage displays the Intelligent Tracking toolbar.



This toolbar offers the following options:

- **Off:** Disables Intelligent Tracking.
- **Auto:** Enables Intelligent Tracking. Constantly monitors for and actively tracks motion.
- **Click:** Allows a user to click on a moving target in the live video image to enable the VG5 700 AutoDome to track the movement of the selected target.

Note: This feature is available only from the Livepage. This feature is not available from the Bosch Video Controller version 1.3.812. Support for the Click feature is planned for the BVC 1.4 release.

If the Intelligent Tracking feature is set to Auto or Click, the live video image displays an eye icon in a color that conveys the state of the Intelligent Tracking:

- **SEEK state:** steady white
Intelligent Tracking is actively seeking a target to follow.
- **IDLE state:** alternating black and white, slow cycle
Intelligent Tracking lost the selected target and will wait for the target to reappear using the last known trajectory. During the IDLE state the camera will not seek other objects in motion.
- **ACTIVE state:** alternating black and white, fast cycle
Intelligent Tracking is actively tracking a target.
- **PASSIVE state:** steady black
Intelligent Tracking attempts to passively track a target while a user has camera control.

If the Show VCA metadata option is selected (in the Settings page -> Livepage Settings) the live view will show the following metadata objects in the Livepage view:

- Objects in motion are initially identified in the video by a yellow outline.
- Actively tracked object in motion are identified in the video by a blue outline.
- When an object in motion is lost, a blue diamond appears designating the area where the target was lost.

1.5 Use Cases

The following two use cases detail typical applications of Intelligent Tracking. The following cases assume that you have installed and configured the camera according to *Section 1.2 Guidelines for Implementing Intelligent Tracking, page 5*, and to *Section 1.4.1 Setting Up for Intelligent Tracking, page 6*. Begin each case from the Livepage view.

Note: You may need to enlist the help of two individuals to demonstrate these use cases.

1.5.1

Use Case 1: Automatic Intelligent Tracking on a Preset Scene

This use case is a basic application of Intelligent Tracking. In this case, the AutoDome 700 is set to view a door and to automatically track an individual exiting the doorway.

Define the Preposition Scene

1. Click the Settings link at the top of the Livepage.
2. Open the Advanced -> Camera -> Prepositions and Tours page.
3. Navigate to the doorway scene that you want to define as a preposition.
 - a. Click the View Control link.
 - b. Use the PTZ controls to move the camera into position.
4. Click the Add scene (“+”) button to define the preposition.
5. Select a scene number 1 for the scene preposition.
6. Type an optional name for the scene, up to 20 characters long.
7. Click OK to save the scene to the Preposition list.

The asterisk (*) to the left of the scene name indicates the scene is part of the preposition tour.

Define the Inactivity Parameters

1. Open the Advanced -> Camera -> PTZ Settings page.
2. Set the Inactivity option to Scene 1.
3. Set the Inactivity Period to 10 seconds.
4. Click the Livepage link at the top of the page.

Demonstrate Intelligent Tracking

1. Ensure that the Auto radio button is selected in the AutoTrack toolbar.
2. Click the Preset Scene 1 button, located under the PTZ controls in the View Control dialog box.
3. Cue an individual to walk through the doorway to trigger the automatic Intelligent Tracking feature.

The Livepage displays the VCA outline around the individual and Intelligent Tracking will control the camera to keep the target in scene.
4. To demonstrate the IDLE state, instruct the individual to walk behind a pole or other obstruction (not a tree or a bush). The camera enters the IDLE state and attempts to pick up the track as the individual moves away from the obstruction.

1.5.2

Use Case 2: Using Intelligent Tracking with a Preset Tour

This case demonstrates using the Intelligent Tracking Click option to manually identify a target to track. In this case, two individuals walk through a doorway in close proximity, then separate as they walk away from the door.

1. Ensure that the AutoDome 700 has the preposition and inactivity parameters set as described in Use Case 1.
2. Ensure that the Auto radio button is selected in the AutoTrack toolbar.
3. Click the Preset Scene 1 button, located under the PTZ controls in the View Control dialog box.
4. Cue the individuals to walk through the doorway in close proximity and then walk shoulder to shoulder as they move away from the door.
The Livepage displays the VCA outline around both individuals (as long as they are close to each other) and Intelligent Tracking will control the camera to keep the targets in scene.
5. Cue the individuals to start to diverge from one another.
Intelligent Tracking will lock on to the larger target and track just this individual.
6. Click the Click radio button in the AutoTrack toolbar.
Note: When in the Intelligent Tracking Click mode, the in-window PTZ controls are disabled. You must use the PTZ controls in the View Control tab to control the camera.
7. Use the PTZ controls in View Control tab to locate the untracked individual and then click on that individual to begin tracking.

1.6 Known Behaviors and Limitations

1.6.1 Known Behaviors

- When the AUX 78 ON/OFF command is issued to activate/deactivate Intelligent Tracking, The AUX 78 ON command selects last known Intelligent Tracking mode (either Auto or Click). If the last user-selected mode for Intelligent Tracking is Click, and a user issues the AUX 78 OFF command to deactivate Intelligent Tracking, all subsequent AUX 78 ON commands will activate Intelligent Tracking in the Click mode.
- Intelligent Tracking remains in the IDLE state while the camera is moving due to a user action (for example, initiating AutoPan).
- IVA deactivates Intelligent Tracking on presets configured with Motion+ or IVA 5.5 Flow.
- When switching between the Auto and Click modes, allow for a transition time as the camera switches algorithms.

1.6.2 Known Limitations

- The Click mode works only on the Livepage view. BVC does not support the Intelligent Tracking Click mode.
- Once Intelligent Tracking loses a tracked target and enters the IDLE state, Intelligent Tracking will not react to any other motion in the field of view. The feature requires a user action or an Inactivity Mode setting to recover from the IDLE state.
Workaround: Pair Intelligent Tracking with an Inactivity Mode setting (for example, moving to a preset) to automatically recover from the IDLE state.
- Motion from moving leaves/branches that present a persistent fixed motion may cause Intelligent Tracking to track the motion of the leaves and branches. Once the Intelligent Tracker locks onto this type of movement it cannot break from the ACTIVE state unless the motion stops or a user issues a manual action.
Workaround: Cover persistent fixed motion with a privacy mask to mitigate false tracking.
- Intelligent Tracking may track two (or more) closely spaced moving elements (for example, two or more people) as a single motion object. When the path of the individuals begin to diverge creating two or more separate motion objects, Intelligent Tracking will follow one object at random.
Workaround: Use the Click option to select the desired object you want to track.
- While the camera is in active Night Mode, Intelligent Tracking exhibits a “hang” after motion is lost. The camera appears to be fixed in place. The camera may remain in place for extended periods of time (hours have been observed) until some other event occurs.
- Intermittent loss of tracking has been observed. While in the ACTIVE state Intelligent Tracking may suddenly divert to the opposite direction of the tracked motion (the motion track appears to take the shape of a small hook). Motion is then lost and Intelligent Tracking enters the IDLE state. There is no known cause or workaround.

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