

Application Note

ATM Protection Kit Installation Procedure

1. Introduction

Bosch is providing customers a robust solution to deter ATM attacks through early detection and reporting by installing the Bosch ATM protection kit. This hardware/software solution combines the use of our B5512 series control panel and supporting hardware devices, along with video analytics to deter ATM theft and destruction. This procedure contains useful information necessary to prepare the ATM location for installation.

Bosch cameras can be configured to detect suspicious activities around ATMs using the camera's built-in video analytics. Bosch intrusion panels can communicate with those cameras to monitor the status of the analytic tasks and generate alarms to report those suspicious activities to a central monitoring station.

Scenarios

Hook and chain attacks:

An attempt to dislodge the ATM occurs during off-peak hours when a vehicle (truck) backs up to the ATM and attaches a chain around the ATM and attempts to pull away or dislodge the ATM from its base or foundation.

ATM cassette theft:

An attempt to dislodge the ATM cassettes from the ATM machine, by the use of power tools or other devices.

ATM technician attack:

While doing normal maintenance on the ATM, the ATM technician is attacked or distracted by someone and another individual who takes advantage of the situation.

Requirements

ATM Protection Kit contents:

B5512 control panel	D116 siren
B11 enclosure	ISC-SK10 shock sensor
CX4010 transformer	B444-V2 cell module
B915 keypad	ISN-CSM20-WGW commercial door contact

Software:

- **Bosch Remote Programming Software (RPS)**. Use this software to configure the control panel.
- **Bosch Configuration Manager**. Use this software to configure the Bosch camera.

Link: [Configuration Manager](#)

Hardware (recommendation)

- **Bosch Flexidome Micro 3100i Outdoor camera**. The Bosch Flexidome Micro 3100i Outdoor camera is a great choice for this application. This camera provides a wide field of view to capture the area in front of the ATM.

Link: [NUE-3702-F02](#)

Workflows

A successful installation is achieved by completing this installation in various phases:

- **Phase 1. Hardware installation** – installing the ATM kit contents into the ATM location.
- **Phase 2. Programming** – configuring and programming the various devices through RPS and establishing communication with a monitoring service.
- **Phase 3. Camera configuration** – configuring the camera using Bosch Configuration Manager software.

2. Hardware Installation

Install the hardware according to the product’s installation instructions. This installation process is similar to a regular commercial installation at a store, or retail space. The only difference is, the “ATM” becomes the retail space in this scenario.

1. Install the control panel enclosure into the ATM housing.
2. Install the control panel and other kit accessories into the enclosure similar to normal installation workflows.
3. Install any Bosch cameras that will be used in monitoring the ATM.
4. Upon completion of the hardware installation, proceed to the programming/configuration phase of the install.

3. Programming/configuration

3.1 Configuring the control panel and hardware accessories using RPS

Configure the hardware using RPS similar to previous retail space installations.

1. Open RPS
2. Connect your device containing RPS to the control panel.
3. Configure your devices according to standard programming selections.
4. Continue to section 3.2: **Configuring the control panel to monitor the Bosch camera.**

3.2 Configure the intrusion control panel areas

Perform this task to enable areas 1, 2, and 3 as well as their respective Area Text.

1. Locate **AREA WIDE PARAMETERS** function.
2. Select **Area/Bell Parameters, Open/Close Options**.
3. Enable **Area 1, Area 2, and Area 3** by selecting **Yes** for all 3 areas.

AREA WIDE PARAMETERS	Area 1	Area 2	Area 3
Area Name Text	ATM Sensors	Camera Vehicle Analytics	Camera Crowd Detection
Area Name Text (Second Language)			
Area On	Yes	Yes	Yes

4. Select **No** for **All On – No Exit**. DO this for all 3 areas.

AREA WIDE PARAMETERS	Area 1	Area 2	Area 3
Exit Delay Restart	Yes	Yes	Yes
All On - No Exit	No	No	No
Exit Delay Warning	No	No	No

3.3 Configure the ATM shock sensor and tilt sensor points

Perform this task to configure the ATM shock sensor and tilt switch points.

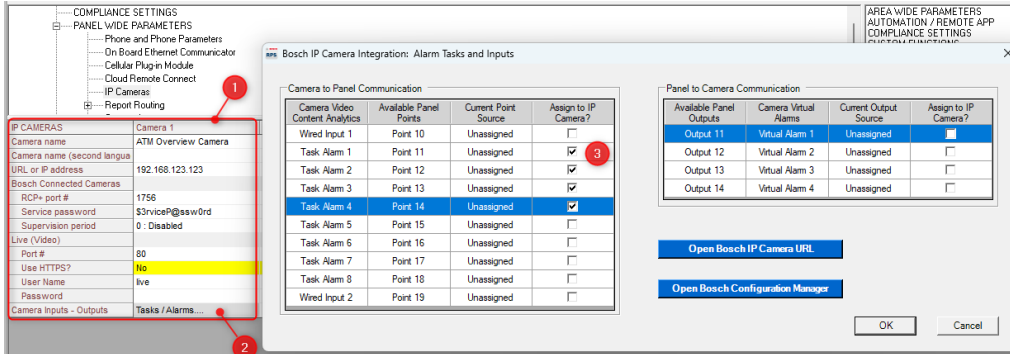
1. Select two points (one for the shock sensor, and one for the tilt switch).
2. Set both point profiles to **7: Part On: Instant**.
3. Set both point areas to **1: ATM Sensors**.

POINT	Source	Text	2nd Lang	Profile	Area
Point 1	Onboard	ATM Shock Sensor		7: Part On: Instant	1: ATM Sensors
Point 2	Onboard	ATM Tilt Switch		7: Part On: Instant	1: ATM Sensors

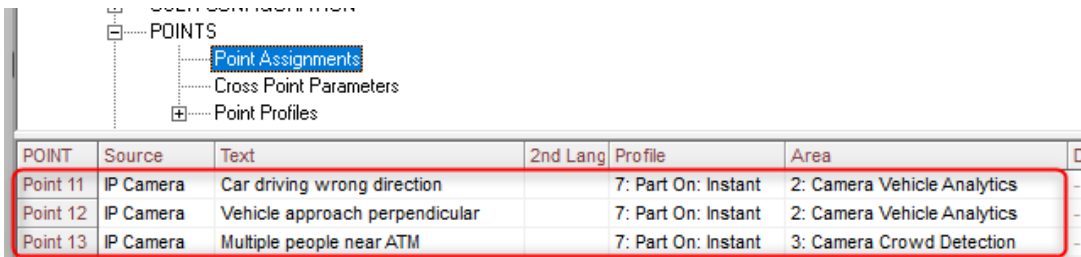
3.4 Configure the intrusion control panel to monitor the camera

Configure the panel to monitor the camera’s analytics tasks and generate the appropriate alarms.

1. Locate **PANEL WIDE PARAMETERS > IP Cameras**.
2. Fill out the connection details for the IP camera (Callout #1).
3. Double-click **Tasks/Alarms** to open the **Bosch IP Camera Integration: Alarm Tasks and Inputs** screen (Callout #2).
4. Select the check box under **Assign to IP Camera?** For each task that has been configured in the camera (Callout #3).



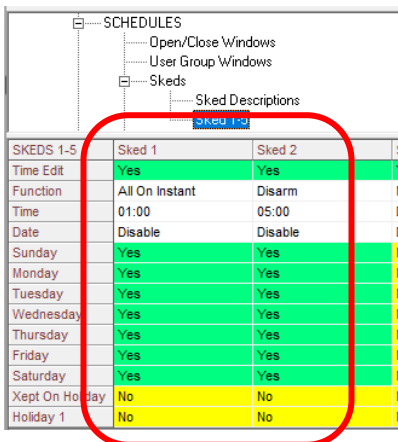
5. Locate **POINTS > Point Assignments**.
6. Configure the IP Camera points for **7: Part On: Instant** under **Profile**.
7. Assign the points to the appropriate area under **Area**. The first two IP Camera task points should be assigned to the **Camera Vehicle Analytics** area and the third should be assigned to the **Camera Crowd Detection** area.



3.5 Set Camera Vehicle Analytics area to arm on a schedule

Configure the camera’s vehicle analytics by creating two “Skeds”, one to arm during the start of the most high-risk times, and another to disarm at the conclusion of that high-risk time.

1. Locate **SCHEDULES > Skeds**.
2. Select **Skeds 1-5**.
3. Program **Sked 1** and **Sked 2** as shown.

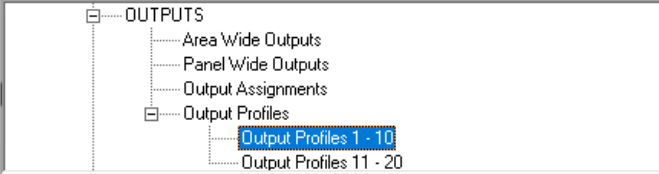


3.6 Configure the Camera Crowd Detection area to arm when the ATM Sensors area is disarmed

This task will be accomplished by configuring one output that will be turned on when the ATM Sensors area is disarmed, and another output that will turn on when the ATM Sensors area is armed. These will be set to trigger Custom Functions to Arm/Disarm the Camera Crowd Detection area in response.

3.7 Configure the Output Profiles

1. Locate **OUTPUTS > Output Profiles 1 - 10**.
2. Configure the first profile to **ATM Sensors Disarmed**.
3. Configure the second profile to **ATM Sensors Armed**.
4. Make those selections for both profiles as shown.




OUTPUT PROFILES 1 - 10	1	2
Profile Name	ATM Sensors Disarmed	ATM Sensors Armed
Output Behavior [A]		
Trigger 1	Area disarmed	All on armed
Scope	Area Wide	Area Wide
Scope Filter	1: ATM Sensors	1: ATM Sensors
AND Trigger 2	Disabled	Disabled
Scope	Panel Wide	Panel Wide
Scope Filter	0	0
Pattern	On Steady	On Steady
Delay	00:00:00	00:00:00
Duration	Follows Trigger	Follows Trigger

3.8 Configure the Custom Functions

Within **CUSTOM FUNCTIONS** you will configure one custom function to “Arm the Camera Crowd Detection” area, and one to “Disarm the Camera Crowd Detection” area.

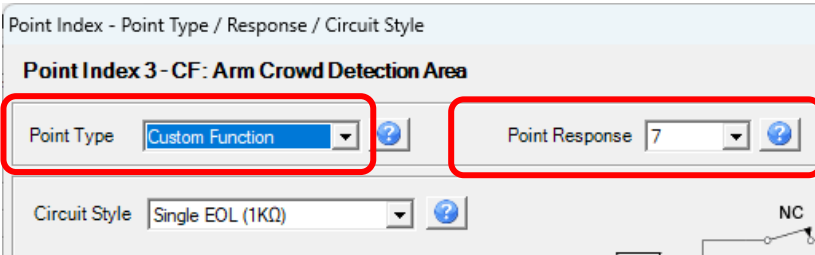
1. Locate **CUSTOM FUNCTIONS**.
2. Select **All On Instant** for Custom Function Text: “Arm Camera Crowd A.”
3. Select **Disarm** for Custom Function Text: “Disarm.”



CUSTOM FUNCTIONS	Custom Function Text	Custom	Function 1	Function 2
CF 128	Arm Camera Crowd A		All On Instant	Not In Use
CF 129	Disarm Cam Crowd A		Disarm	Not In Use

3.9 Configure the Point Profiles

1. Locate **Point Index > Point Profiles**.
2. Select **Point Profiles 1 – 10**.
3. Make sure **Point Type** is set to **Custom Function**.
4. Make sure **Point Response** is set to **7**.



Point Index - Point Type / Response / Circuit Style

Point Index 3 - CF: Arm Crowd Detection Area

Point Type: Custom Function

Point Response: 7

Circuit Style: Single EOL (1KΩ)

5. Select the **Custom** Function that should be activated when the associated point is triggered. Refer to the following screen:

POINT PROFILES 1 - 10		3	4
Point Profile Text (First Language)	CF: Arm Crowd Detection	CF: Disarm Crowd Detect	
Point Profile Text (Second Language)			
Point Type / Response / Circuit Style	Custom Function	Custom Function	
Entry Delay	30	30	
Entry Tone Off	No	No	
Alarm Abort	No	No	
Wireless Point Supervision Time	4 Hours	4 Hours	
Custom Function	Arm Camera Crowd A	Disarm Cam Crowd A	
Monitor Delay	00:00	00:00	
Delay Response, Disarmed	00:00	00:00	
Delay Response, Armed	00:00	00:00	

3.10 Assign the Point Profiles

Choose any two unused points and set their Point Source.

1. Locate **POINTS > Point Assignments**.
2. Select any two unused points and set their **Point Source** to **Output**.
3. Set **Profile** to the same profile that were in the previous section (**Arm Crowd Detection Area** and **Disarm Crowd Detection**).

POINT	Source	Text	2nd Lang	Profile	Area
Point 9	Output	ATM Sensors Area Disarmed		3: CF: Arm Crowd Detection Area	1: ATM Sensors
Point 10	Output	ATM Sensors Area Armed		4: CF: Disarm Crowd Detection	1: ATM Sensors

3.11 Assign the Output Profiles

Take note of the Point numbers that were assigned in the previous step. By setting their **Point Source** as **Output**, the Output with the same number will be the one that would trigger the point. For example, Point 9 would be triggered by Output 9. Since Point 9 is supposed to be the trigger to Arm the Crowd Detection area when the ATM Sensors area is disarmed, Output 9 needs to be assigned the Output Profile that would activate when the ATM Sensors area is disarmed.

1. Locate **OUTPUTS > Output Assignments**.
2. Assign the Output Profiles accordingly:

Output Assignments	Output Source	Output Text	Output Te:	Output Profile
Output 9	Unassigned	ATM Sensors Disarmed Trigger		1: ATM Sensors Disarmed
Output 10	Unassigned	ATM Sensors Armed Trigger		2: ATM Sensors Armed

3.12 Camera analytics creation (Bosch Configuration Manager)

Create analytic tasks to capture suspicious activities such as wrong way entry to an ATM site, a vehicle approaching the ATM at a perpendicular angle to the expected traffic flow, or multiple individuals (crowds) loitering around the ATM late at night. This could also include an attempt to distract an ATM technician as he or she performs normal maintenance work at an ATM site.

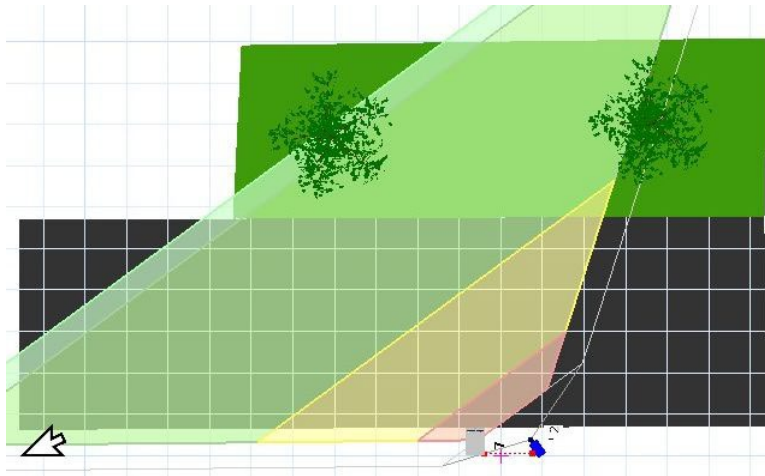
The three tasks useful in providing protection against ATM attacks and are documented in this document are:

- **Wrong Way:** This task helps detect a vehicle approaching the ATM from the wrong direction.
- **Vehicle Backing Up:** Detects a vehicle approaching the ATM from a perpendicular path. This simulates a vehicle attempting to connect a chain the ATM and pull it away from its foundation/base.
- **Crowd:** Detects where two or more people are gathered in front of the ATM. This helps detect a situation where a technician is servicing the ATM and is approached by another individual serving as a distraction to the technician,

while another individual attempts to steal the ATM cassettes.

Assumptions:

- The simulated camera field of view was created assuming the camera was mounted at a height of 8' and is located about 7' before the ATM on the entry side:



Additional resources:

For additional information, the following videos are available on YouTube. These videos help explain how to use Bosch Configuration Manager and how to set up the Video Camera Analytics (VCA) Tasks:

- [Object in Field](#)
- [Video Analytics How-To playlist](#)

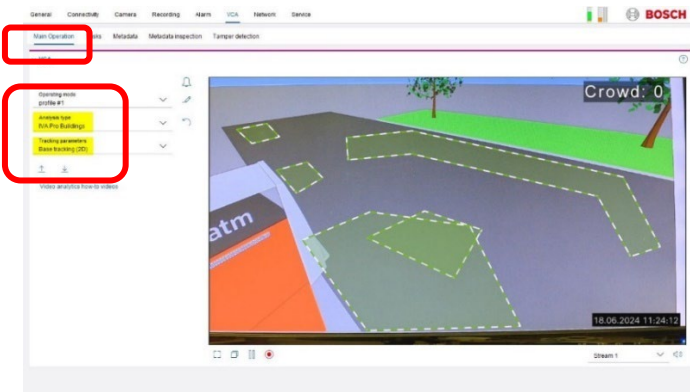
For the three tasks described above (*Wrong Way*, *Vehicle Backing Up*, and *Crowd*), **Object in Field** tasks will be created. Additional tasks can be added using different task types. Final configuration will depend on the installation and the field of view.



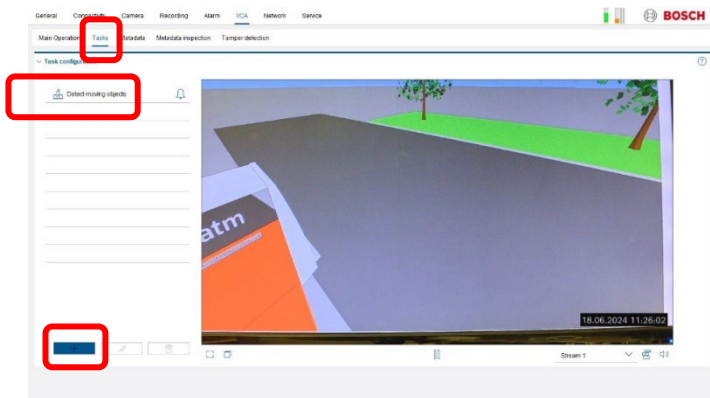
Notice!

The instructions listed in this document represent highlighted steps to assist in the configuration process, and are not all-inclusive to the complete Bosch Configuration Manager workflow. Please refer to Bosch Configuration Manager documentation for a complete understanding of software workflows and operation.

1. Launch Configuration Manager.
2. Select your device from the tree.
3. Select **VCA**.
4. Select **Tasks**.
5. Press the “+” button.
6. Select **Object in field** and assign a *Task name*.
7. Press the “>” button.
8. Make sure the analysis type is set up for **IVA Pro Buildings**, and the tracking parameters is **Base tracking (2D)**.

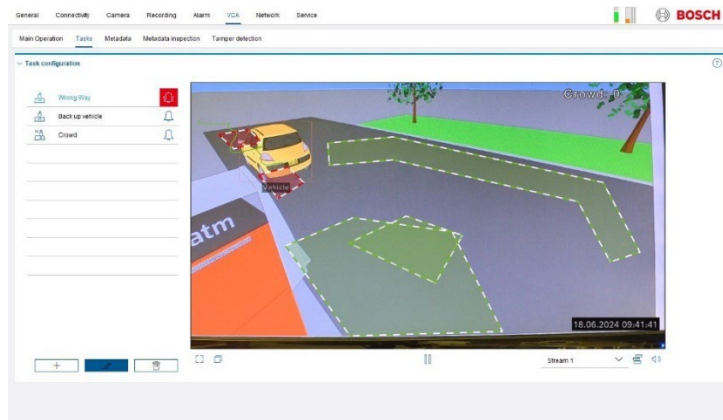


9. Select **Tasks** > “**task name**” and select the **Trash** icon to delete the default moving objects. Once completed, the screen will be clear of the default objects and look like the screen below. You can now create your desired tasks.

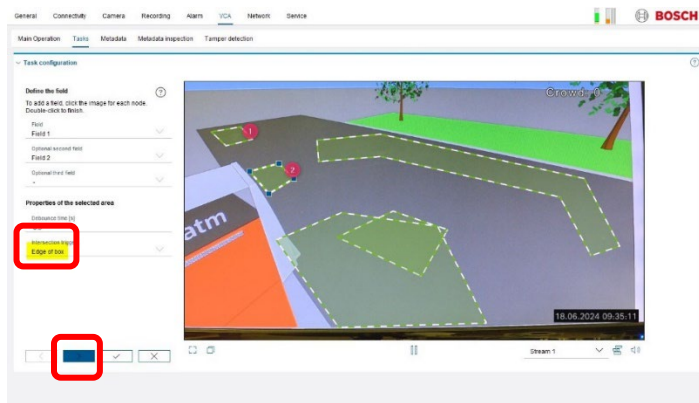


3.12.1 Task 1: Wrong way

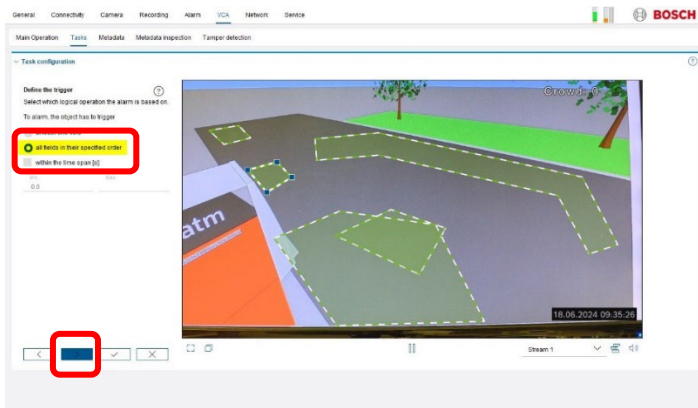
This task works by detecting a vehicle in an initial field and then detecting that same vehicle entering a second field.



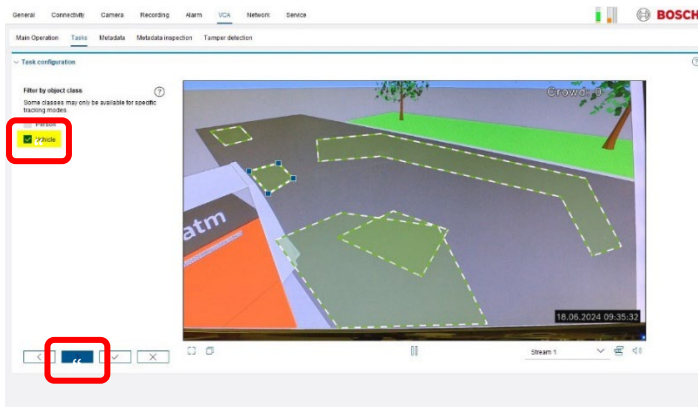
1. Draw two fields. The first field should be further away from the ATM location. The second field should be closer.
2. Arrange the fields so that these newly created fields will detect a vehicle moving in the wrong direction.
3. Select **Edge of box** for the intersection trigger and select “>.”



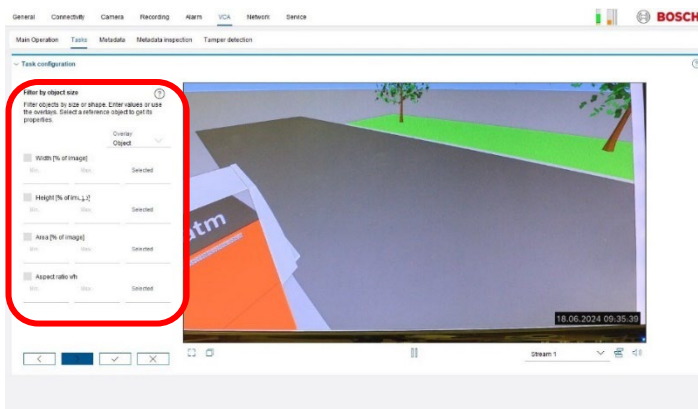
4. Select **all fields in their specified order** and select “>.”



5. Select **Vehicle**, and select “>.”

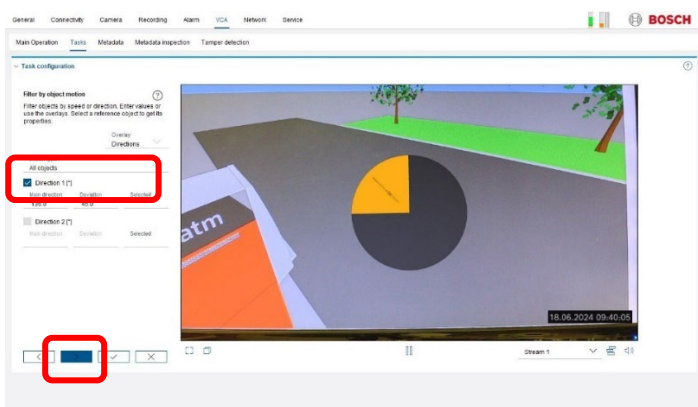


No changes are required here. But, if we wanted to further filter by object size or shape we could make adjustments in the following screen.



Filtering by direction could help reduce potential for false alarm. Adjust the direction circle to detect vehicles moving in the wrong direction relative to the drive-up ATM lane.

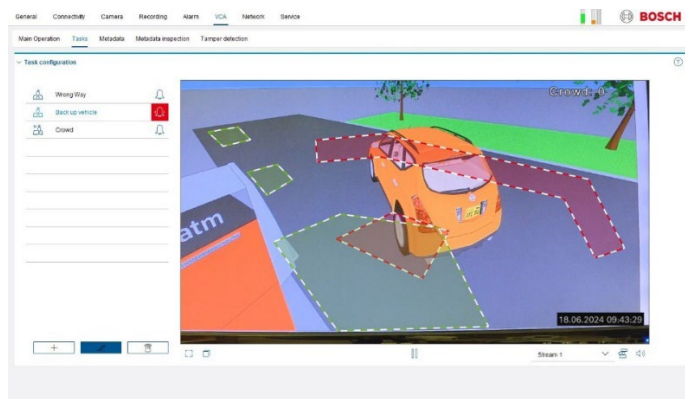
6. Select “>.”



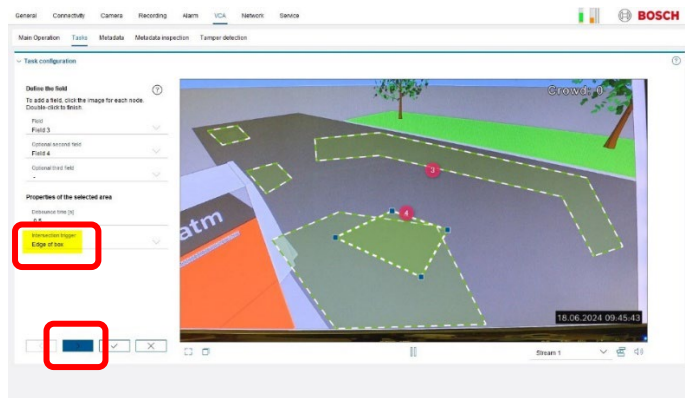
7. Task is complete.

3.12.2 Task 2: Vehicle backing up

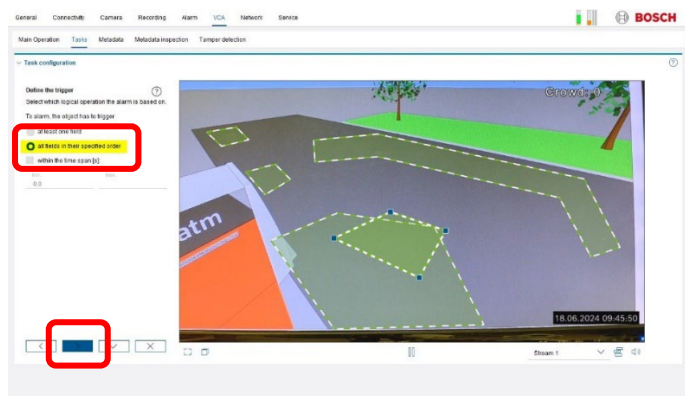
This task is similar to the **Wrong Way** task but detects a vehicle backing up to the ATM with the intention of connecting a chain.



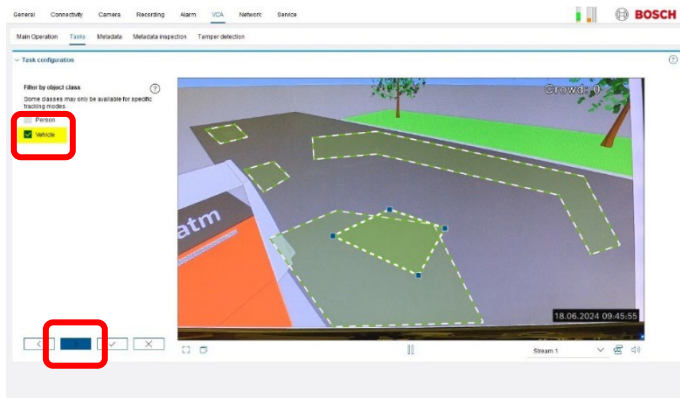
1. Draw the first field that will detect a vehicle approaching the ATM from an angle that would not be considered normal for someone using the ATM as intended.
2. Draw a second field closer to the ATM location in which a vehicle might approach from.
3. Select **Edge of box** for the intersection trigger and select “>.”



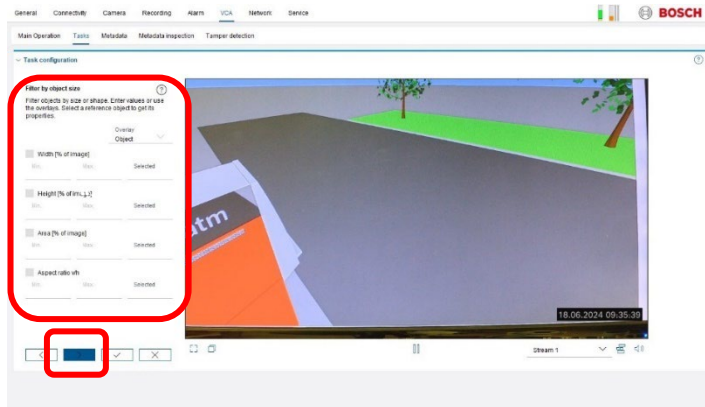
4. Select **all fields in their specified order** and select “>.”



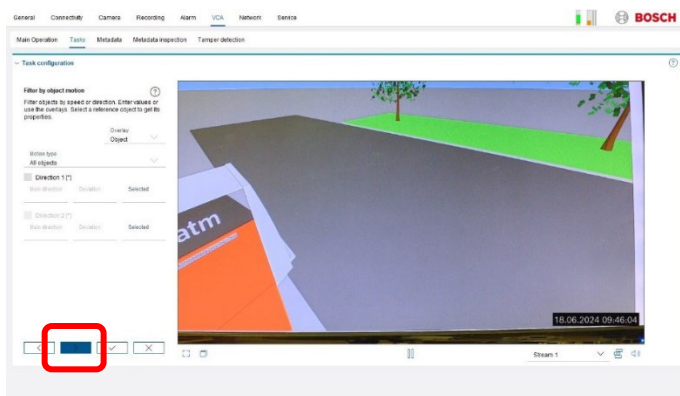
5. Select **Vehicle**, and select “>.”



No changes are required here. But if we wanted to further filter by object size or shape we could make adjustments in the following screen.

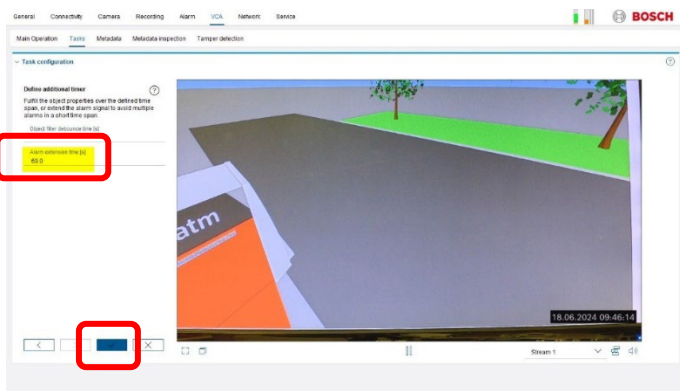


6. Select “>.”



7. Make sure the **Alarm extension time** is set to **60.0**.

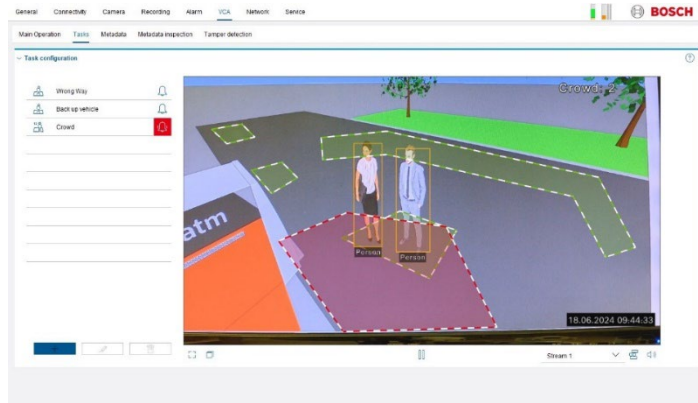
8. Select “>.”



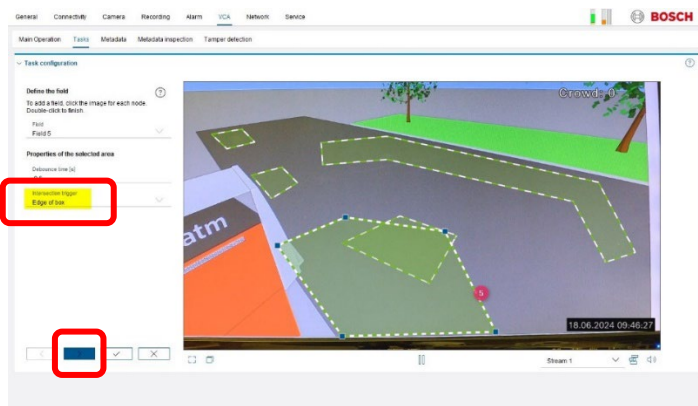
9. Task is complete.

3.12.3 Task 3: Crowd

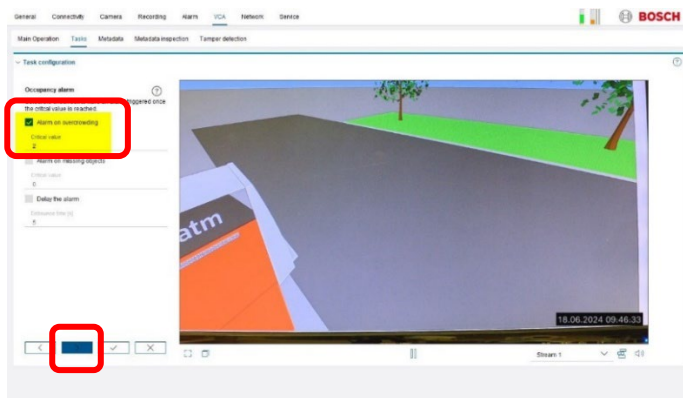
This task will trigger when 2 or more persons are detected in front of the ATM.



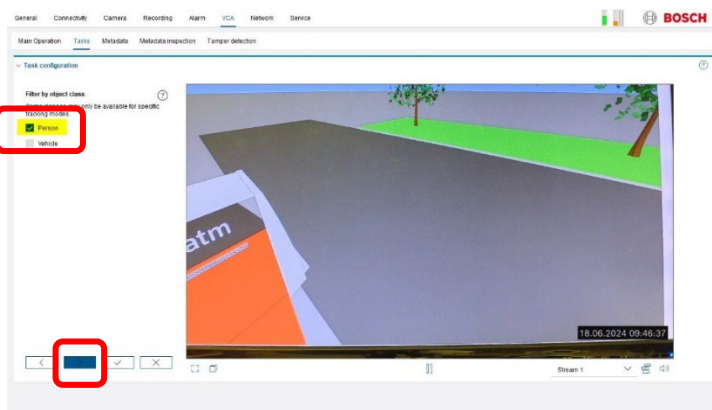
1. Draw a field in front of the ATM. Actual size and location will depend on the field of view.
2. Select **Edge of box** for the intersection trigger and select “>.”



3. Select **Alarm on overcrowding** and select “>.”

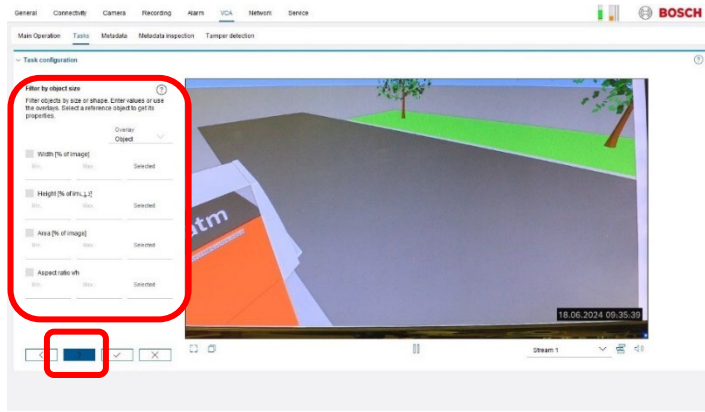


4. Select **Person** for this task and select “>.”

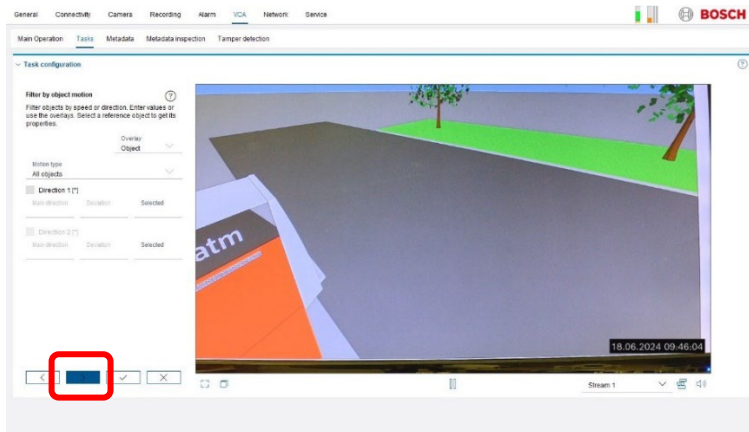


No changes are required here. But if we wanted to further filter by object size or shape we could make adjustments in the

following screen.

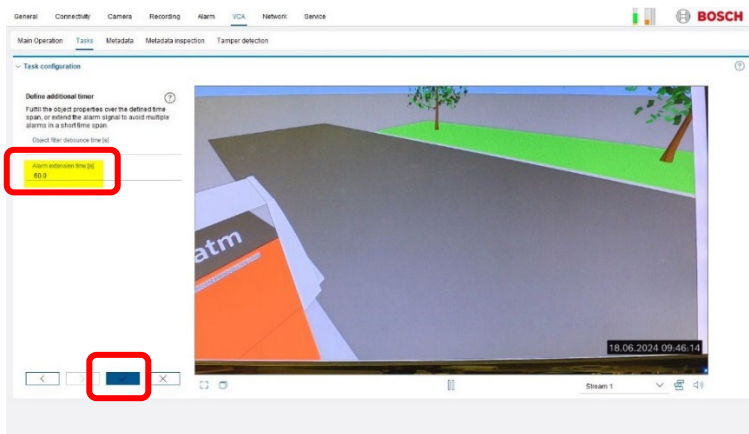


5. Select “>.”



6. Make sure the **Alarm extension time** is set to 60.0.

7. Select “>.”



8. Task is complete.

3.12.4 Task Script

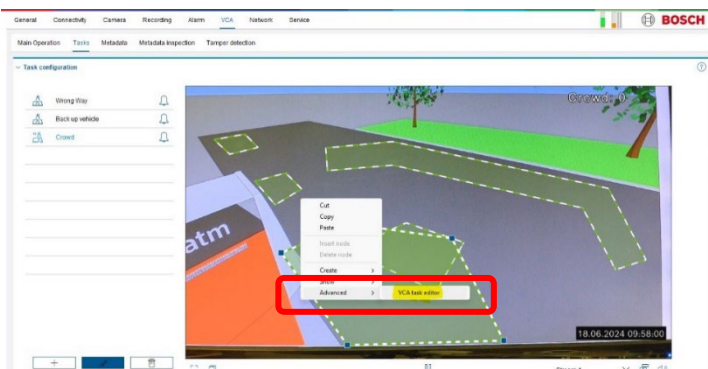
The process of creating the tasks using the configuration manager GUI creates a script. That script is included here. As a starting point, it is possible to copy and paste the script into configuration manager.

```

Resolution := { Min(-1, -1) Max(1, 1) };
Field #1 := { Point(-0.885, -0.611) Point(-0.757, -0.650) Point(-0.704, -0.553) Point(-0.820, -0.503) DebounceTime(0.50) ObjectSet(BoundingBox) };
Field #2 := { Point(-0.717, -0.305) Point(-0.590, -0.366) Point(-0.524, -0.249) Point(-0.633, -0.132) DebounceTime(0.50) ObjectSet(BoundingBox) };
Field #3 := { Point(-0.425, -0.549) Point(-0.149, -0.596) Point(0.739, -0.253) Point(0.894, 0.271) Point(0.769, 0.344) Point(0.633, -0.109) Point(-0.148, -0.423) Point(-0.418, -0.383) DebounceTime(0.50) };
Field #4 := { Point(-0.337, 0.202) Point(-0.094, -0.000) Point(0.144, 0.144) Point(0.030, 0.503) DebounceTime(0.50) ObjectSet(BoundingBox) };
Field #5 := { Point(-0.318, 0.012) Point(0.100, 0.117) Point(0.313, 0.867) Point(-0.331, 0.900) Point(-0.603, 0.223) DebounceTime(0.50) ObjectSet(BoundingBox) };
//@Task T:1 V:0 I:1 "Wrong Way" {
//[1.a=(s1:1,s2:2);1.b=1;1.c=31;1.d=30;1.f=32;8.a=(12:0.0,14:1);7.a=C:10|;4.a=c:1;2.a=(e1:1,e2:91.00,e3:181.00);]
ObjectState #32 := Direction within(91,181.00) and HasClass( Vehicle );
ObjectState #31 := InsideField #1;
Event #31 := OnSet ObjectState #31;
ObjectState #30 := InsideField #2 and ObjectState #32;
Event #30 := {Event #31 before OnSet ObjectState #30 where first.oid == second.oid};
external ObjectState #1 := InsideField #2 and Event #30 within(0,*);
external Event #1 := OnSet ObjectState #1;
//@}
//@Task T:1 V:0 I:2 "Back up vehicle" {
//[1.a=(s2:4,s1:3);1.b=2;1.c=29;1.d=28;1.f=27;8.a=(12:0.0,14:1);7.a=C:10|;]
ObjectState #27 := HasClass( Vehicle );
ObjectState #29 := InsideField #3;
Event #29 := OnSet ObjectState #29;
ObjectState #28 := InsideField #4 and ObjectState #27;
Event #28 := {Event #29 before OnSet ObjectState #28 where first.oid == second.oid};
external ObjectState #2 := InsideField #4 and Event #28 within(0,*);
external Event #2 := OnSet ObjectState #2;
//@}
//@Task T:18 V:0 I:3 "Crowd" {
//[1.a=5;1.b=3;1.c=26;1.g=(id:3,x:0.572,y:-0.972);2.a=(b3:2,c3:0,e3:5,b1:1);10.a=C:1|;]
ObjectState #26 := InsideField #5 and HasClass( Person );
external Counter#3:= { ObjectsInState #26 Text("Crowd:") TopLeft(0.572,-0.972) };
external SimpleState#3:= Counter#3 within(2,*);
//}

```

8. Copy the contents from the text box above to use the script.
9. Open **Configuration Manager**.
10. Select **VCA > Tasks** tab.
11. Right-click on the video image.
12. Select **Advanced > VCA task editor**. If there are already tasks configured in the camera, simply select all the existing text and delete it first.



13. Paste the script from above into the editor window.
14. Select **OK** and save. Once the script is pasted and saved, you can go back to the **VCA Tasks** tab and adjust the fields as necessary for the installation.
15. Process is complete.

3.13 ATM attack scenarios

The table below describes various ATM attack scenarios/risks as well as ways in which the camera and supporting control

panel system respond to the specified attack.

Risk	Detection and control	response
<p>Hook and chain attack: Suspect walks up to drive-up ATM during RISK hours</p>	<p>Camera uses VCA to detect person in front of ATM.</p> <p>Control panel schedule controls when event response is required.</p>	<p>Play pre-recorded message to alert suspect that they have been detected.</p> <p>Response designed to not scare away legitimate customers.</p> <p>“alert” report sent to monitoring center.</p> <p>Video available at monitoring center.</p>
<p>Hook and chain attack: suspect opens ATM hood</p>	<p>Magnetic contact and shock sensor detect attack.</p> <p>Control panel schedule determines if alarm should be instant (during risk hours) or delayed (during normal service hours to allow technician to service or for cash handlers to perform service).</p>	<p>Activate siren and strobe.</p>
<p>Truck backs up to ATM</p>	<p>Camera uses VCA to determine if vehicle is coming from the wrong direction.</p> <p>In normal direction for customer access = OK</p> <p>Back up to face of ATM = instant response</p> <p>Back up ATM lane = instant response</p> <p>Shock sensor detects attack – initiates instant alarm.</p>	<p>Local alert – siren and strobe Alarm is transmitted to monitoring station.</p> <p>Video accessible at monitoring station.</p>
<p>ATM removed</p>	<p>Shock/tilt sensor activates instant alarm.</p>	<p>Alarm message over cellular (IP connection was severed).</p>
<p>ATM technician attack</p>	<p>ATM technician activates fixed panic button in ATM.</p> <p>ATM technician activates wireless panic button – requires receiver in ATM.</p> <p>Camera uses VCA multiple people in front of ATM while ATM is disarmed for service = instant alarm.</p>	<p>Local alert – siren and strobe.</p> <p>Alarm is transmitted to monitoring station.</p> <p>Video accessible at monitoring station.</p>

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