

VIVOTEK Panoramic PTZ

Installation Guide

Using the combination of the calibration tool, fisheye, speed dome cameras, and the VAST or Milestone software

Rev. 1.2

Revision History:

- * Rev. 1.0: Initial Release
- * Rev. 1.1: Updated revision information for software components
- * Rev. 1.2: Updated supported camera models and software components.



Required Components

The following components are required for a Panoramic PTZ configuration:

| # | Hardware or Software Components | FW/SW Rev. |
|----|--|---|
| 1. | A server running VAST management software or Milestone XProtect | VAST: 1.7.7.x or later Milestone: A. Corporate XProtect Server - Corporate, Enterprise, Professional, and Express XProtect Smart Client - 2013 R2 (8.1b) XProtect Device Pack - 6.14 |
| 2. | A PC to run the Calibration tool utility.* | Windows 7 preferred |
| 3. | The Calibration tool utility | 1.0.0.3 |
| 4. | An SF8174 or SF8174V series fisheye camera. | 0100c |
| 5. | An SD8363E speed dome camera. | 0201f |
| 6. | Accessories such as: - PPTZ CELLING MOUNT ASS'Y KIT: 100113400G - PPTZ WALL MOUNT ASS'Y KIT: 100113300G ** | - |
| 7. | Plug-in installer programs for Milestone XProtect | 1.0.2.5 (x86 & x64) |

* The calibration tool can also run on the VAST server.

** You may also refer to VIVOTEK's website for the latest supported models or list of accessories, such as <http://www.vivotek.com/web/product/accessories.aspx>. Support for other models can be available through time.

II Conceptual Basics

Before the configuration begins, there are several facts the user should take into account:

1. There is a dominant - subordinate relationship between the fisheye camera and the speed dome. All configurations are done on a PC running the Calibration tool and a web console with the fisheye camera. The computation required for exerting the Panoramic PTZ control takes place on the fisheye camera.

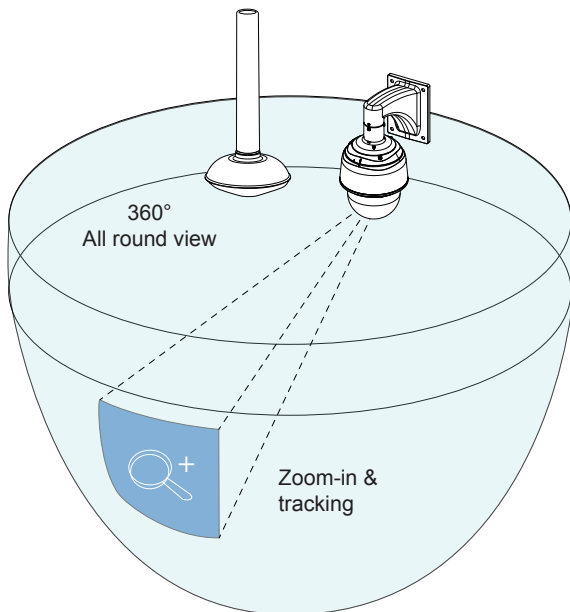


Controller (dominant)
camera

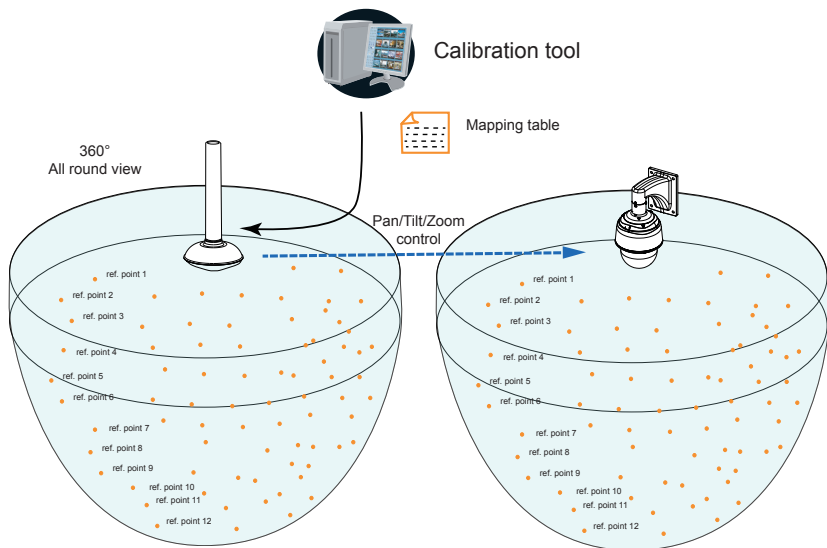


Auxiliary (subordinate)
camera

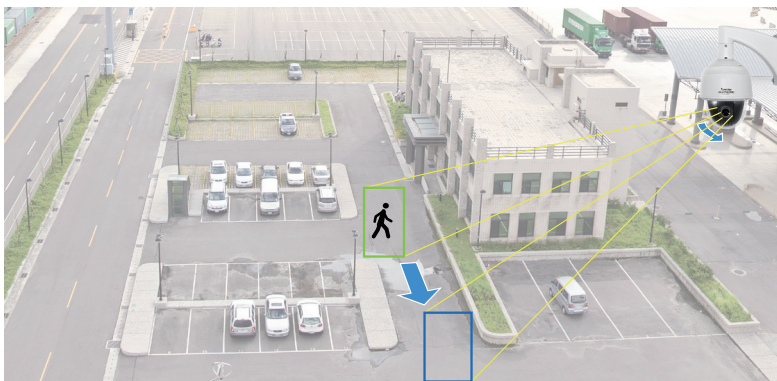
2. In a panoramic PTZ configuration, the fisheye camera provides an overview over the 360° hemispheric field of view; while the speed dome provides tracking, zooming, and keeping an object in a view of an adequate size. The configuration is operated via the VAST or Milestone software with easy clicks and drags.



3. Configuration is made by running the Calibration tool to produce a mapping table. The user manually marks at least **50** referential points on the hemispheric views from both cameras and saves them into a mapping table. The mapping table is then uploaded to the fisheye camera so that they can work coherently, utilizing the best of their unique capabilities.



4. Auto tracking is configured on a web console with the fisheye camera by configuring a region of interest and the minimum object size. Moving objects that entered the ROI will trigger the tracking action.

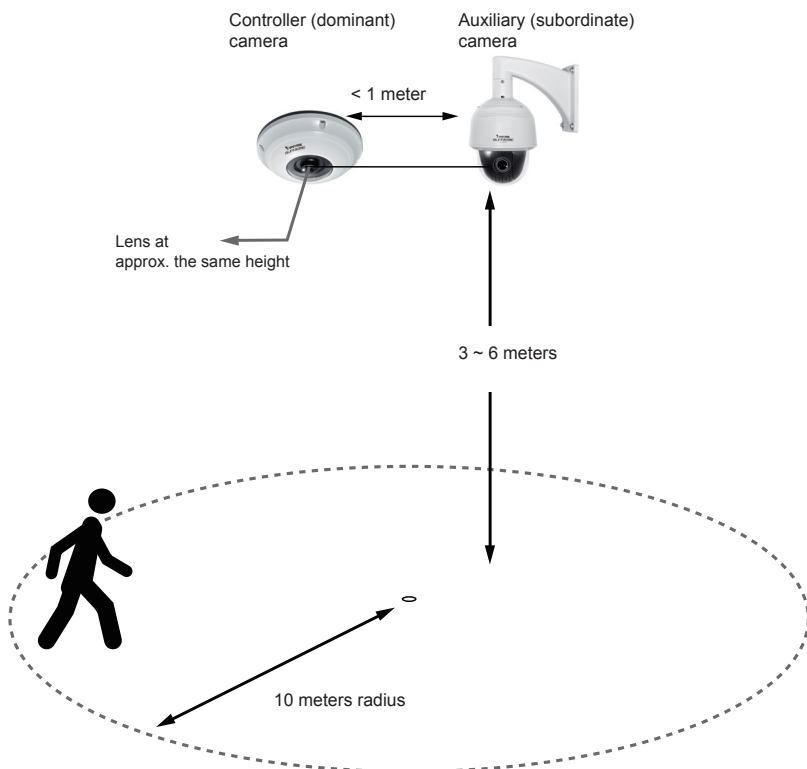


III Installation Concerns

Note the following when installing the fisheye and speed dome cameras:

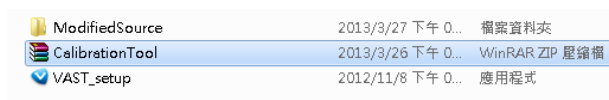
1. Mount the cameras closely together, no greater than **1 meter** apart.
2. The cameras should be mounted at the height of **3 to 6 meters** from the ground, and their lens at approximately the same height.
3. A configuration thus configured can cover a surveillance area of a radius of **10 meters***.
4. Auto tracking, if applied, is designed to track an intruder in a place where human traffic is not heavy, such as a warehouse or a load area. Heavy traffic can result in a constant shift of tracked objects, and reduce the effectiveness of the feature.

* Note that the 10 meter radius area only applies when using the Auto tracking feature. If using manual control, the surveillance area can be much larger.

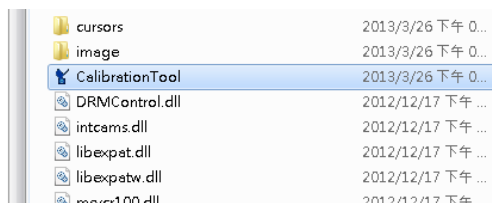


Installing the Calibration Tool

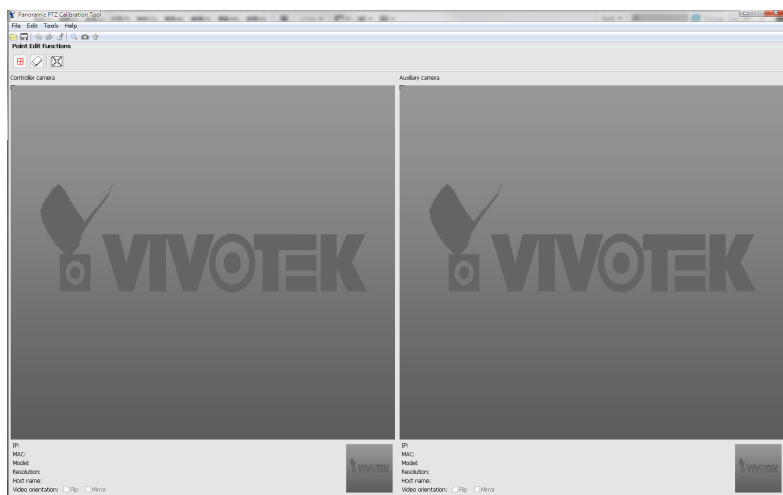
1. Make sure both the fisheye camera and the speed dome are running compatible firmware. If they are not, update their firmware.
2. The Calibration tool comes in a zipped file. Unzip the file to a preferred location on your PC. It is preferred that your management PC or server is connected to the same local network where the cameras reside.
















3. Double-click on the CalibrationTool to execute the program.



4. The program will start and default to the blank screens.



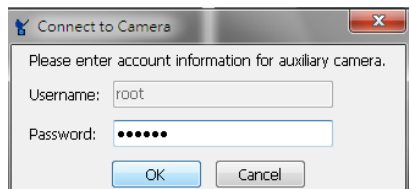
Below are the definitions of the functional buttons:


| Icon | Functional Description |
|---|---|
| Tool bar | |
|  | Opens a mapping table file (previously configured) |
|  | Saves your mapping configuraion |
|  | Undo your previous configuration action |
|  | Redo your prevoius configuration action |
|  | Removes all referential points on the maps. |
|  | Searches for cameras (Controller and Auxiliary cameras) |
|  | Gets new snapshot - the speed dome will patrol and rotate through all view directions to stitch up a hemispheric view |
|  | Uploads the mapping table to camera |
| Point Edit Functions | |
|  | Creates referential points on the maps. When selected, the snapshot views enter the Edit mode. |
|  | When selected, points can be erased by placing the cursor on a referential point and click on it. |
|  | Swaps between the full view and the Regional view. |
| Buttons on the Search Panel | |
|  | Manually adds a camera by entering its IP. |
|  | Refreshes the current camera list. |

The above functions can also be accessed from the menu bar on the main frame window.


The utility will prompt you to enter the credentials for the Controller and the Auxiliary cameras when you open a pre-configured calibration file.

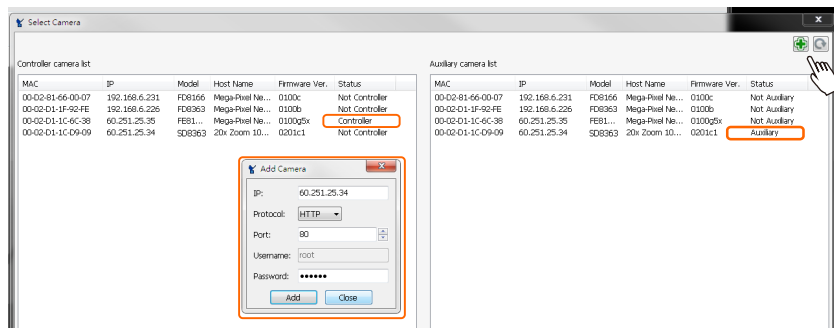
Note that the cameras should be up and running when you open and edit a pre-configured file.



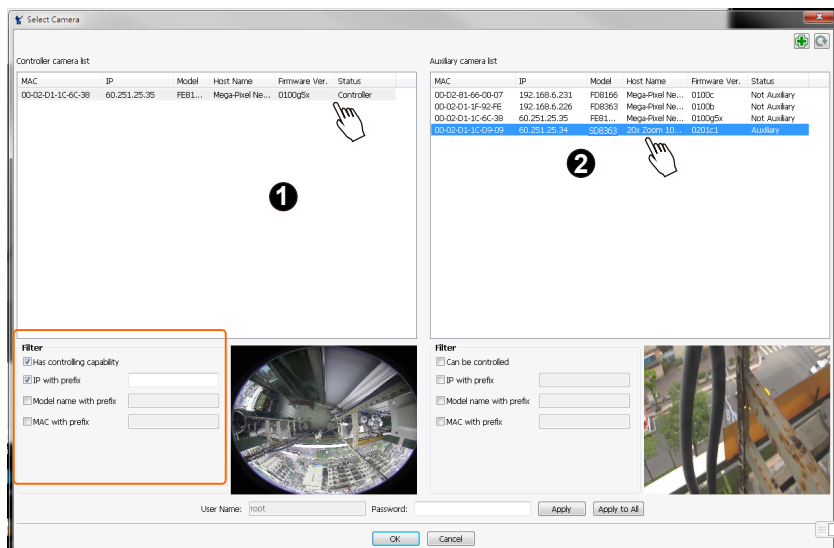
- Click on the Search  button to open the search panel (or using the Ctrl + E key combination) .

6. When the compatible fisheye and speed dome are in the same local area network, they should be listed and indicated as **"Controller"** or **"Auxiliary"** in the Status column.


If your cameras reside in other subnets, you can click the Add  button to recruit them. When in a configuration with numerous cameras, you may also use the **Filtering** conditions by selecting the related checkboxes to find compatible cameras.

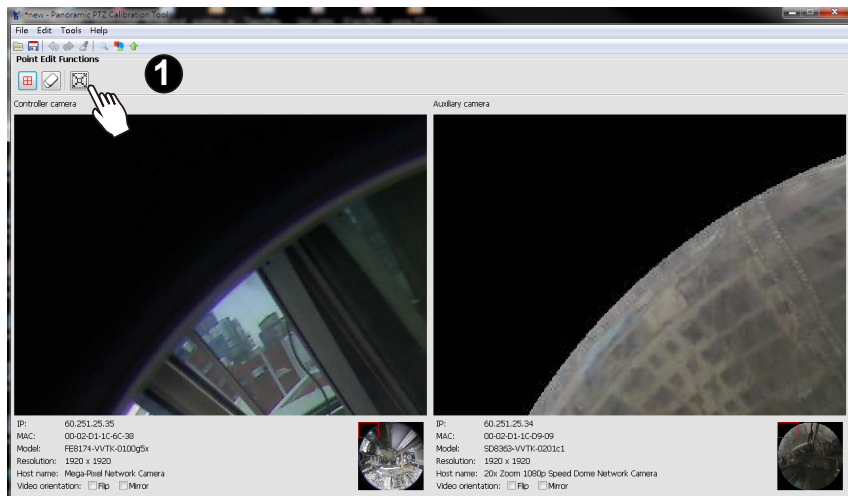


7. Click on a **"Controller"** (fisheye) camera. Its snapshot image will be displayed. Click on the **"Auxiliary"** (speed dome) camera to display its snapshot.




8. Click **OK** to close the search panel.

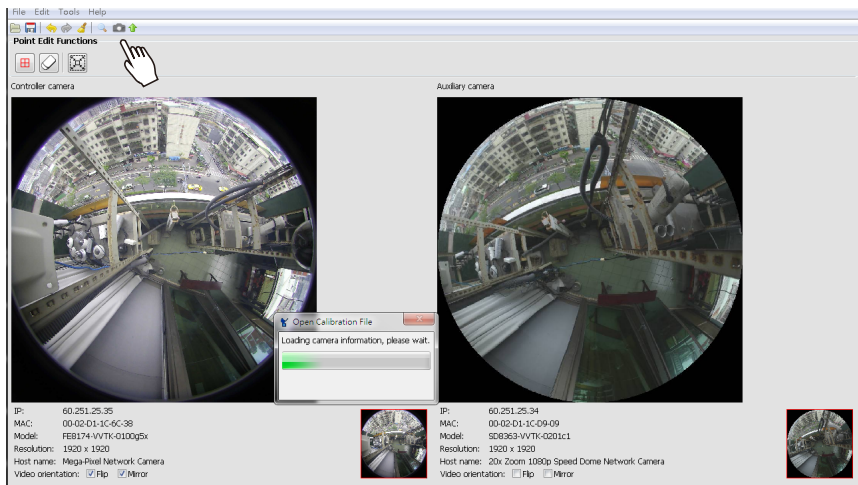
9. Once the cameras are selected, the Calibration Tool defaults to the Regional view, which shows only a small portion of the hemispheric view. It is recommended to begin your configuration using the Full view. Click on the View Swap  button to enter the full view mode.




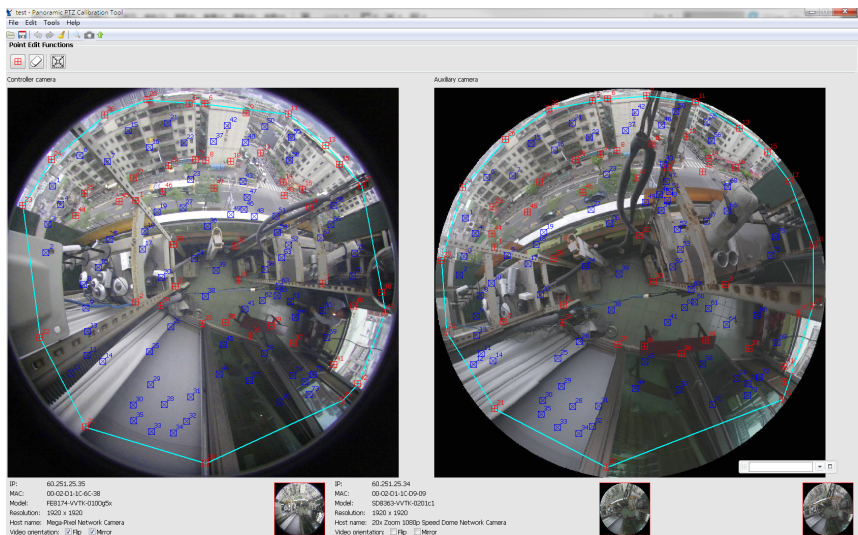
NOTE:

It is possible that the snapshots of the two cameras can be facing different directions. If this occurs, change the cameras' orientation or positions before using the Calibration tool.



10. It is highly recommended to bring in the latest snapshot from the speed dome camera (the Auxiliary). Click on the **New Snapshot**  button. The speed dome will pan, tilt, to cover all shooting directions in order to stitch up a hemispheric view. The process will take about 2 minutes to complete.

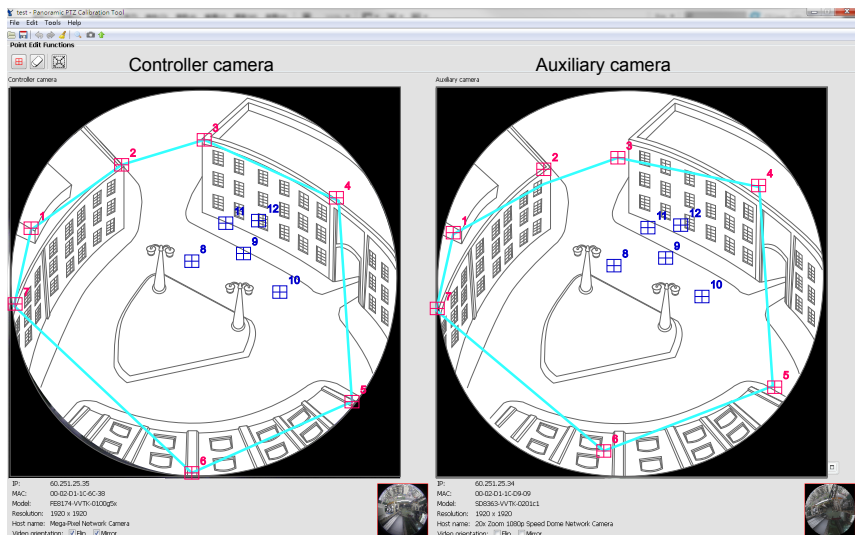



11. When the full view is loaded, click on the **Add point**  button to begin your configuration.



Configuration Using the Calibration Tool

1. Your cursor will become the Add Point  pointer. Select the following to place your pointers: the corners of permanent objects, such as the edges of concrete infrastructures, corners of a building, turns of a road, etc. Please avoid using non-permanent objects such as trees and vehicles.
2. Place your cursor on prominent objects by a single click. Place at least **50** points on the fisheye camera's snapshot. Each pointer will be given an index number. The corresponding  pointers will also appear on the Speed dome's snapshot. You can temporarily ignore the pointers on the right panel, and fine-tune their positions later.
3. In a complex scene, you can create up to **256** points on the snapshots. Theoretically, more referential points means more precisely the two cameras will coordinate.





4. Predicted points  will be automatically generated when you insert several pointers.

You can click on any of them to turn them into the succeeding pointers, or simply ignore them and choose the next place where you want to place the pointers. You can select the predicted points by a single click. When selected, the predicted points will turn red and become the next pointers.



Tips:


1. As shown in the diagram above, you can start your configuration by placing pointers around the circular edge of the snapshot.
2. You can then check the differences between the predicted points  on the left and on the right panels. If the differences are enormous, you can consider insert one or more pointers in that area.

5. When you created an enough number of points on the snapshot, fine-tune the referential points on the right panel. When moving an existing point, the cursor will become the hand  cursor. Select and tune the position of each pointer by click and drag. Make sure each pointer is placed at the same position as that on the left panel; for example, the two #5 pointers on both sides should all be placed on a corner of the same building.

To remove a point, click on the **Erase**  button, and click on a point to remove it.

Click on the **Add Point**  button to return to the edit mode.

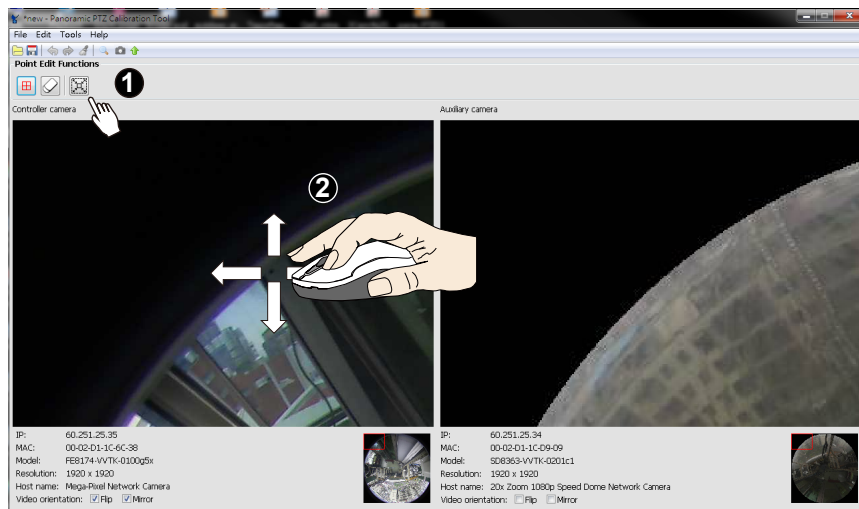
6. Fine-tune the positions in the Regional view.

6-1. Click on the Swap View  button to enter the Regional view.


6-2. To change the view angle, click and hold down your left mouse button, move your mouse around to the direction you prefer.

6-2. When in a desired region of view, release the mouse button, and start tuning the positions of pointers.

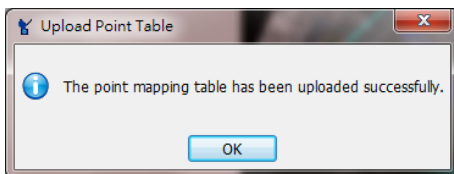
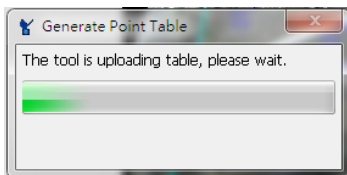
6-4. You can then fine-tune the positions of the referential points on this window.



7. Click on the **Save**  button to preserve your configuration.

8. Click on the **Upload**  button to upload the mapping table to the fisheye camera (the Controller camera). You may also use the Ctrl + U key combination.

8. The upload may take a short while. When done, proceed with the camera firmware settings.





Auto Tracking Configuration Steps

1. Open a web console with the "Controller" fisheye camera. When in the same subnet, use VIVOTEK's IW2 utility to locate the camera.
2. Access the Panoramic PTZ configuration page through Configuration > Applications > Panoramic PTZ.

The screenshot displays the VIVOTEK web interface for configuring a camera. The top navigation bar includes links for Home, Client settings, Configuration, and Language. The left sidebar lists various system settings categories: System, Media, Network, Security, PTZ, Event, Applications, Recording, Local storage, and [Basic mode]. The main content area is titled "Applications > Panoramic PTZ" and contains three tabs: General settings, Import/Export files, and Auto tracking. The Auto tracking tab is active, showing options to "Enable Panoramic PTZ" and "Enable Auto tracking", both of which are checked. Below these is the "Auxiliary camera information" section, which includes fields for IP address (172.19.11.100), HTTP port (80), and Controller camera account (User name and Password). There are "Test" and "Save" buttons. At the bottom, there is a checkbox to "Associate the auto tracking event with the auxiliary camera's manual trigger" with radio button options 1, 2, and 3.

SUPREME
A NEW DEFINITION OF HD

Home Client settings **Configuration** Language

Applications > Panoramic PTZ

General settings Import/Export files Auto tracking

☒ Enable Panoramic PTZ

☒ Enable Auto tracking

Auxiliary camera information

IP address: 172.19.11.100

HTTP port: 80

Controller camera account

User name:

Password:

Test

Associate the auto tracking event with the auxiliary camera's manual trigger ☐ 1 ☐ 2 ☐ 3

Save

Version: 0100d

- On the General settings pane, select both the **"Enable Panoramic PTZ"** and **"Enable Auto tracking"** checkboxes.
- The Auxiliary camera information and the Controller camera account provide configuration options to the partner cameras in case that their IP addresses may be changed after the initial configuration. Use of static IPs is highly recommended in a Panoramic PTZ configuration. The **Test** button can be used to test the connectivity between the Controller and the Auxiliary cameras.

Proceed with the following if you prefer recording the video while the speed dome is tracking an object:

- Select one or more **manual trigger** checkboxes, and click Save.

Associate the auto tracking event with the auxiliary camera's manual trigger ☒ 1 ☐ 2 ☐ 3

Save

- Open a web console with the "Auxiliary" speed dome camera.

- Open the **Event** settings page through Configuration > Event > Event settings.

The screenshot shows the Vivotek web interface. The top navigation bar includes the Vivotek logo, the URL www.vivotek.com, and links for Home, Configuration, and Language. The left sidebar contains a menu with the following items: System, Security, Network, Media, PTZ, Event, Event settings (highlighted), Applications, Recording, Local storage, and [Basic mode]. The main content area is titled "Event > Event settings". It contains two sections: "Event" and "Customized script". The "Event" section has a table with columns: Name, Status, Sun, Mon, Tue, Wed, Thu, Fri, Sat, Time, and Trigger. Below the table is an "Add" button and a "Help" link. The "Customized script" section has a table with columns: Name, Date, and Time. Below this table is an "Add" button. At the bottom of the main content area, there is a yellow note box that reads: "Note: Before setup event, you may setup [event server](#) and [event media](#)".

- Click **Add** to create a new event setting.

4-5. Enter an **Event name**, select the **"Enable this event"** checkbox, select the priority of the event, and if you prefer, configure the period of time during which this event setting will take effect .

The screenshot shows the 'Event configuration' page. At the top, there is a text input for 'Event name', a checkbox for 'Enable this event', a dropdown for 'Priority' (set to 'Normal'), and a text input for 'Detect next motion detection or digital input after' (set to '10' seconds). Below this is a section titled 'Event schedule' which contains a weekly calendar grid with all days checked, a 'Time' section with 'Always' selected, and 'From' and 'to' time inputs (both set to '00:00' and '24:00' respectively). On the left, a vertical flow diagram shows '1. Schedule' pointing to '2. Trigger' pointing to '3. Action'. At the bottom right are 'Close' and 'Save event' buttons.

4-6. Click **Trigger** to open the Trigger page.

4-7. Select one of the checkboxes under **"Manual Trigger"** as the triggering cause.

The screenshot shows the 'Event configuration' page with the 'Trigger' tab selected. The top section is identical to the previous screenshot. The 'Trigger' section contains a list of radio buttons: 'Video motion detection', 'Periodically', 'Digital input', 'System boot', 'Recording notify', 'Audio detection', and 'Manual trigger'. The 'Manual trigger' option is selected and highlighted with a red rectangle. Below it, there are three checkboxes labeled '1', '2', and '3', with the first checkbox checked. The left flow diagram and bottom buttons remain the same.

Note that the Manual trigger can last for another 10 seconds after the Controller (fisheye camera) returns to the normal state - no moving objects are detected.

- 4-8. Click **Action** to open the Action page.
- 4-9. Configure the action to take by configuring recording to an SD card or a network attached storage. For more information about Event settings, please refer to the speed dome camera's User Manual.
- 4-10. Click **Save event** to preserve your configuration.

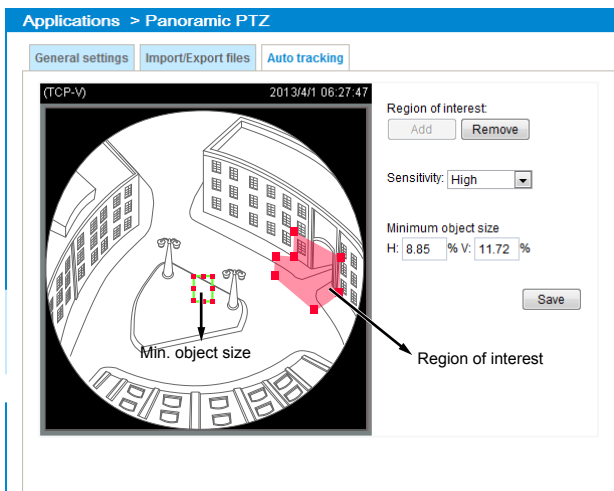
5. On the **Import/Export files** pane, you can see the mapping table information, export the current mapping table for backup purpose, or upload a configured table.

Applications > Panoramic PTZ

The Export and Import functions here allow you to back up the mapping table originally created by the Calibration tool. The time of creation of the mapping table will remain the same as the date when it was created and the file format will be different (from .clf to .map). This serves the purpose of saving the mapping table if the need should arise for restoring firmware defaults.

6. On the **Auto tracking** pane, you can create a region of interest and configure the triggering conditions for Auto tracking.

- **By default, the region of interest is the full view.** Any objects entering the fisheye's field of view will trigger the tracking.
- To configure a region of interest of your choice, click **Remove** and then click **Add** to create a new one.
- You can then click on the screen, each click produces a red square (as a corner mark) to mark the area. Up to 20 red squares can be applied to mark an area of a complicated shape. **Double-click** on the screen to end the configuration process. Click and drag to change the corner marks' positions.
- The green square in the middle of the screen indicates the minimum object size. Auto tracking will be activated **only if the objects entering the region are larger than the minimum size**. The smallest object size is 1.56% x1.56% of the fisheye's field of view. You can click and drag to resize, or drag the mini. size square to a place on the screen to compare and estimate the size of objects that might enter a region of interest.
- You can also manually enter numbers in the percentage boxes to change the size of the minimum object size.



- You can change the Sensitivity value using a pull-down menu. If you select a customized value, a slide bar will appear allowing you to change to a value between 0 and 100. The default is 30.

 **NOTE:**

If you manually configure a detection area for Auto Tracking, the Auto Tracking actions will not trigger system events on the VAST software.

7. Click **Save** to preserve your configuration. Note that you can only configure one region of interest, and the speed dome can track one moving object at a time.

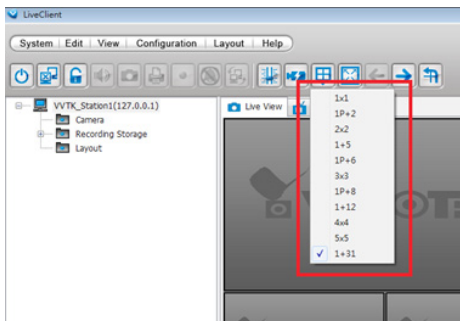
Since only one region of interest is allowed, as long as there is an existing region, the **Add** button will be unavailable.

**NOTE:**

1. Auto tracking is configured on the fisheye camera, and the fisheye camera commands the speed dome camera to track an intruding object.
 2. The speed dome can track one object at a time.
 3. If multiple objects are present, the camera tracks the object that is farthest from the camera.
 4. If a tracked object stays motionless for 10 seconds, camera will abandon it and start tracking another object that is farthest away from the center.
 5. Camera will perform corresponding zoom in/out while tracking an object in order to contain just the silhouette of the moving object.
 6. Installed at a position 6 meters from the ground, the configuration can track a moving object 60cm in width, in an area that is 10 meters in radius. When installed at a position 3 meters from the ground, the configuration can track a moving object 60cm in width, in an area that is 6 meters in radius.
 7. Manual control (such as using a joystick to pan or tilt or using a click on VAST view cell) always has a higher priority than Auto tracking.
-

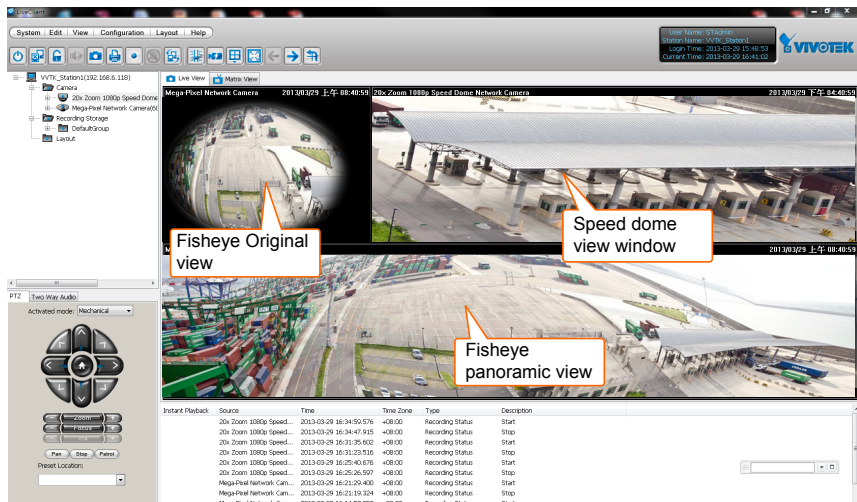
VI Using Panoramic PTZ in VAST

1. Open a LiveClient console with a VAST server. Recruit the Controller and the Auxiliary cameras into VAST.
2. Once done, select a particular layout, **1P+2**, **1P+6**, or **1P+8**, from the layout menu.



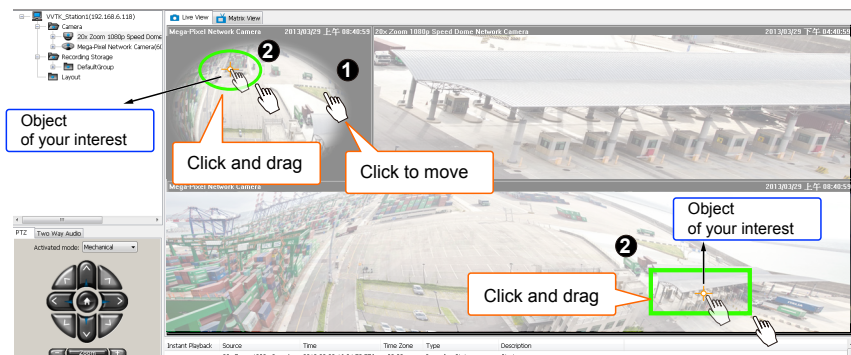
3. Locate the cameras from the device tree, and drag them into the view cells as shown below. Right-click to change fisheye's display mode in the preferred view cell.

Note that only the "10" and "1P" display mode support P-PTZ control.



4. There are two different ways to quickly exert Panoramic PTZ control. To move a speed dome's optical field of view from a fisheye's 360° hemispheric overview:

- 4-1. Click on a spot on the fisheye's Original view where you detected a condition of your interest. The speed dome will aim its lens at the corresponding position to cover that field of view.
- 4-2. Click and drag a region of interest either on the Original or on the Panoramic view. The speed dome will move to that region and zoom in to fill the same proportion of view into its view cell. On the Original view, click-and-drag creates a circular region of interest. On the Panoramic view, a square region. If you draw a small region, the speed dome will zoom in on the scene. The smaller the region, the larger the zoom-in ratio.



The speed dome camera automatically performs optical zoom in/out to best fit the selected field of view until the maximum and minimum zoom ratio is reached.



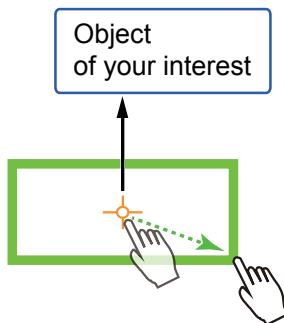
Tips:

When drawing a region of interest, click and drag from the center of your interest over a diagonal line to the bottom right. It is not like drawing a line from corner to corner.



NOTE:

If Auto Tracking is enabled, the Auto Tracking actions can trigger system events, which in turn can tell the VAST server to send Email, record video, and other actions. Please refer to VAST software's documentation.

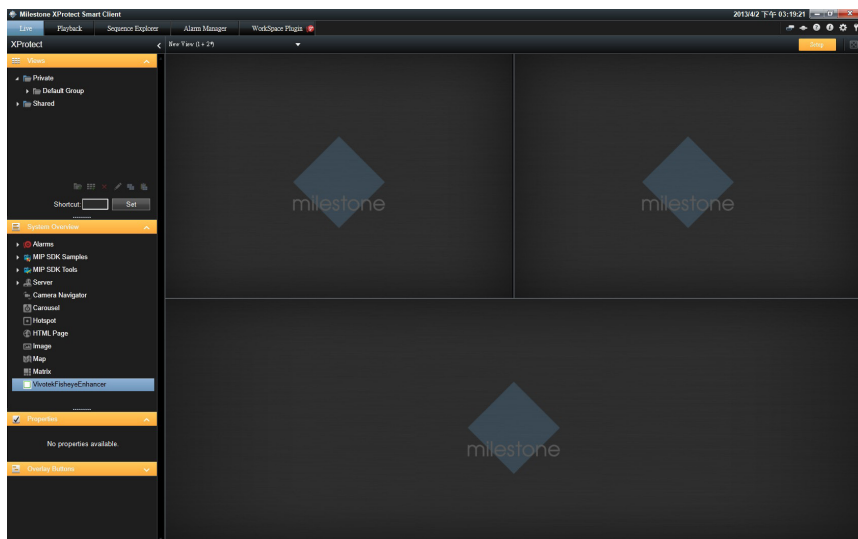


VII Using Panoramic PTZ on Milestone XProtect

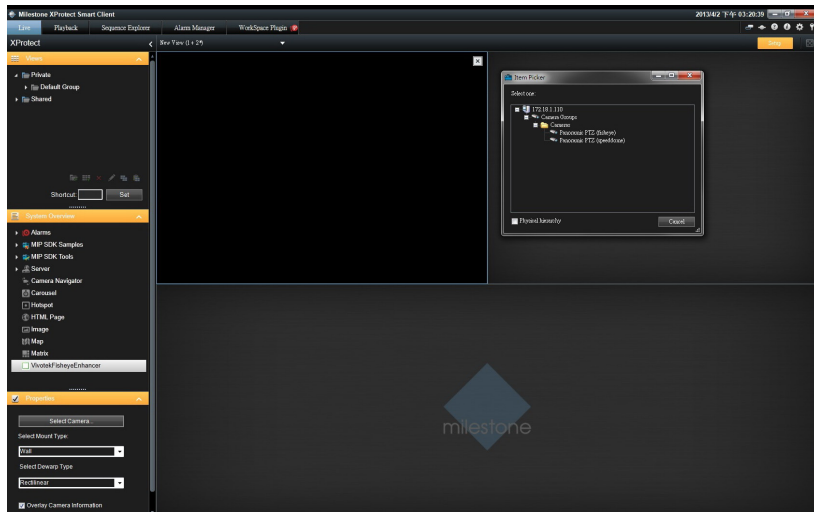
! IMPORTANT:

Currently, the Panoramic PTZ control **can not** be executed on XProtect when the fisheye camera comes with a **user name** and **password**. Please disable the password protection on the Controller camera (fisheye).

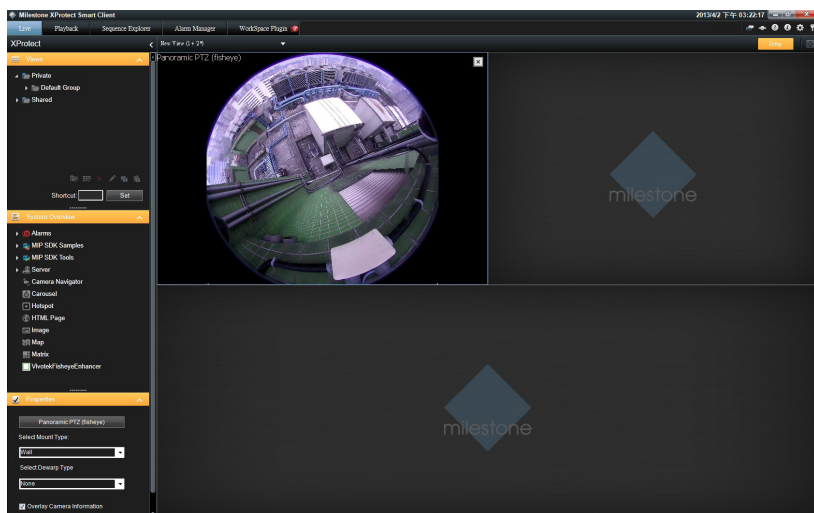
1. Install VIVOTEK's plug-ins for the fisheye camera in a Panoramic PTZ configuration.
The file name will look like this: [VivotekFisheyeEnhancerx64.exe](#). Execute the installer program, and the plug-ins will be installed to XProtect's related folder.
2. Open the XProtect SmartClient. Open a 1+2 layout, and click on VivotekFisheyeEnhancer in the **System Overview** panel.



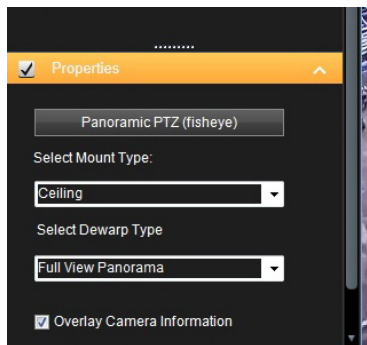
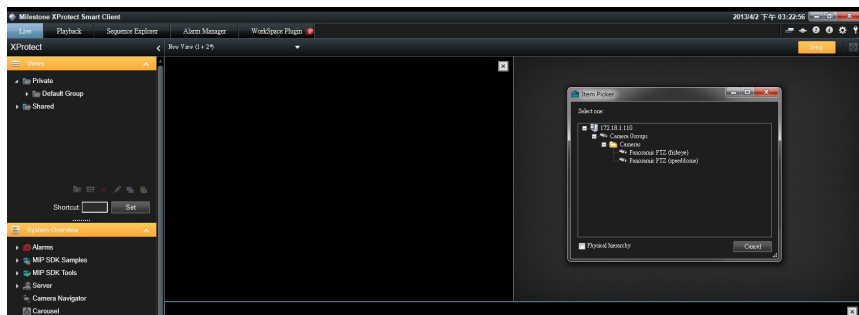
3. In the **Live** window, click on **Select Camera**. Select the Panoramic PTZ (fisheye) camera from the item Picker window.



4. On the first view cell, you do not need to change the **Dewarp** type.



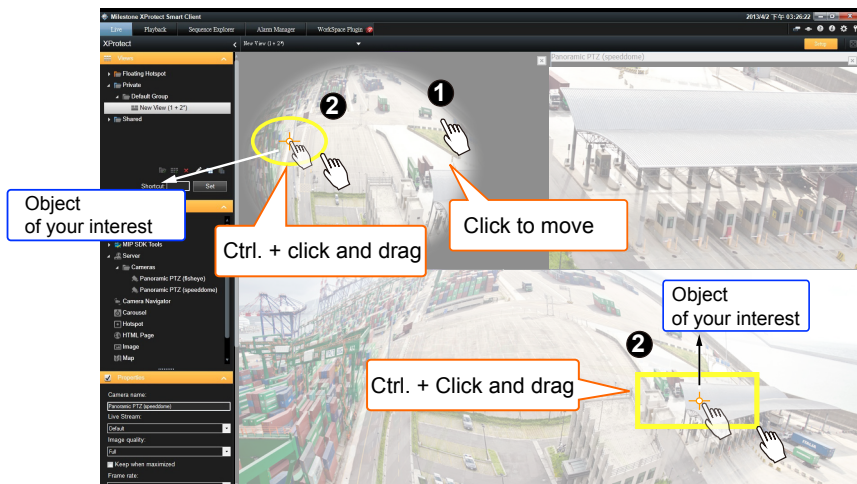
5. Repeat the process to insert the fisheye camera into the lower view cell, and change its dewarp mode to **Full View Panorama**.



6. Insert the speed dome camera to the view cell on the upper right.

7. To move a speed dome's optical field of view from a fisheye's 360° hemispheric overview:

- 7-1. Click on a spot on the fisheye's Original view where you detected a condition of your interest. The speed dome will aim its lens at the corresponding position to cover that field of view.
- 7-2. Press and hold down the **Ctrl** key, click and drag a region of interest either on the Original or on the Panoramic view. The speed dome will move to that region and zoom in to fill the same proportion of view into its view cell. On the Original view, click-and-drag creates a circular region of interest. On the Panoramic view, a square region. If you draw a small region, the speed dome will zoom in on the scene. The smaller the region, the larger the zoom-in ratio.



Tips:

When drawing a region of interest, click and drag from the center of your interest over a diagonal line to the bottom right. It is not like drawing a line from corner to corner.

