



A Safe Fleet Brand

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**360 HD™ AVM**

Around Vehicle Monitoring System

## Automatic Calibration Guide

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## Introduction to Calibration

The calibration process “stitches” together images from the front, back, left, and right camera views into a 360 top-level image of the space around the vehicle. After the physical installation of the cameras, ECU, antennas, push buttons, and optional monitor/recorder, the inView 360 HD AVM system will have to be calibrated to optimize this 360° view. The Automated Calibration process requires someone who is familiar with wizard-like, automated setup procedures. For the Automated Calibration process, the person involved will have to do the following:

- Place calibration pads so that they can be viewed without obstruction.
- Refine the overlay

## Calibration Kit Components

1 x a set of four (4) calibration pads

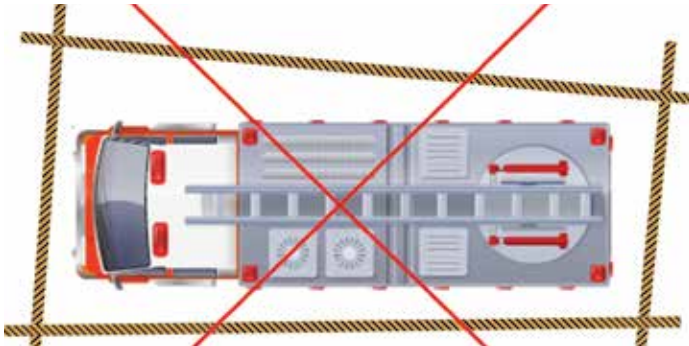


## Placing Calibration Pads

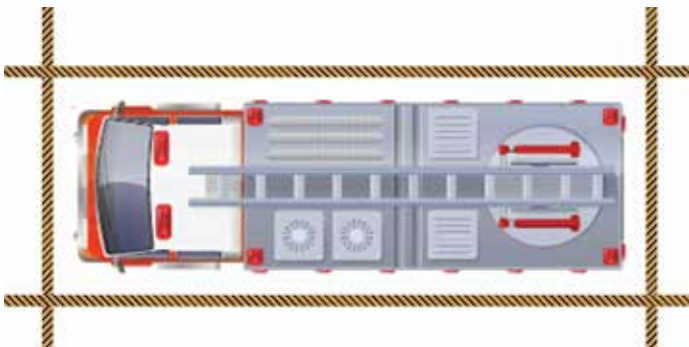
Calibration pads provide reference points for the cameras during the software calibration process. Therefore, it is important that the calibration pads are accurately and optimally placed.

Using the roll of police-type tape provided with the inView 360 HD AVM system kit, create a rectangular perimeter around the vehicle, ensuring that you use perpendicular (90 degree) angles at each corner.

### Incorrect Tape Placement



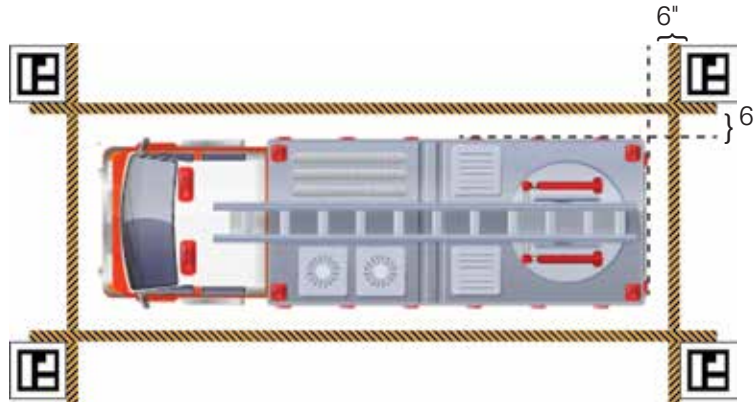
### Correct Tape Placement



### 💡 TIP! Calibration Pad Placement

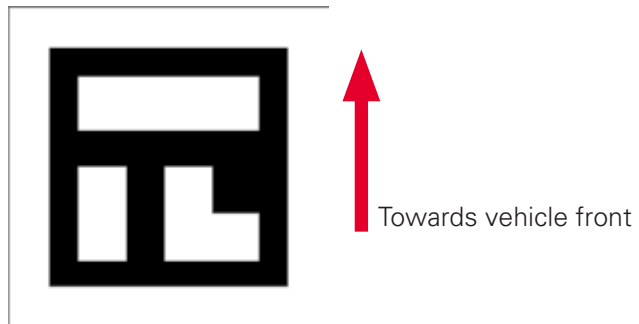
Start by placing the calibration pads need about 6 inches away from all sides of the vehicle. Then check to see if all pads are visible. If any are blocked, then move all pads out an equal amount away from the vehicle. Try placing the pads 12 inches away, and then check again.

**Correct Pad Placement**



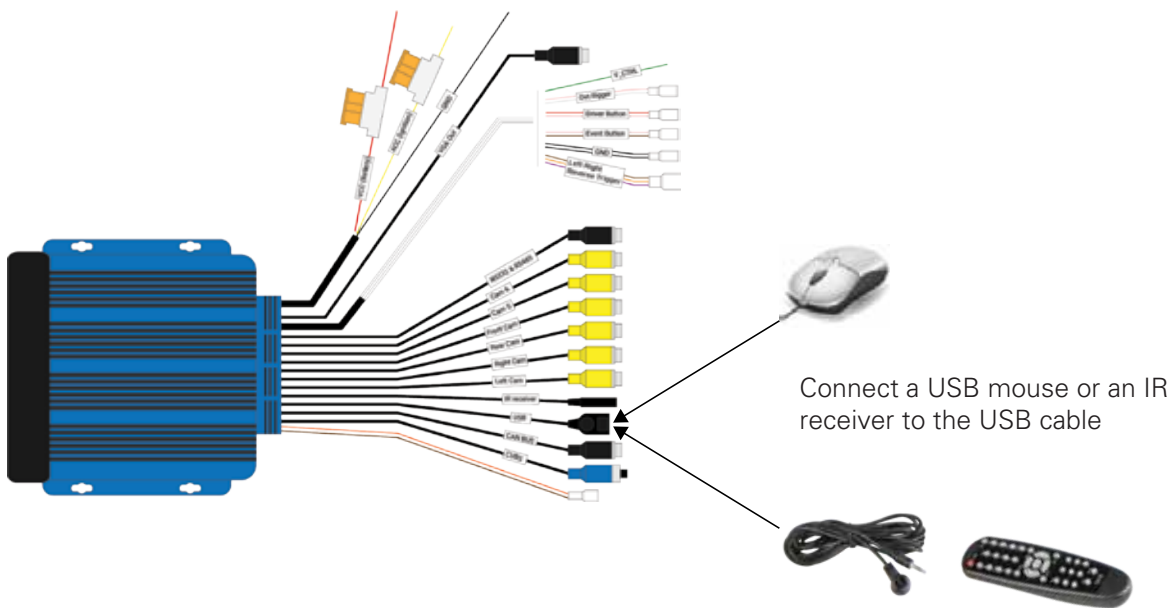
**Correct Pad Orientation**

When placing the calibration pads, ensure that they are in the correct orientation. The long rectangle should be pointing towards the front of the vehicle.



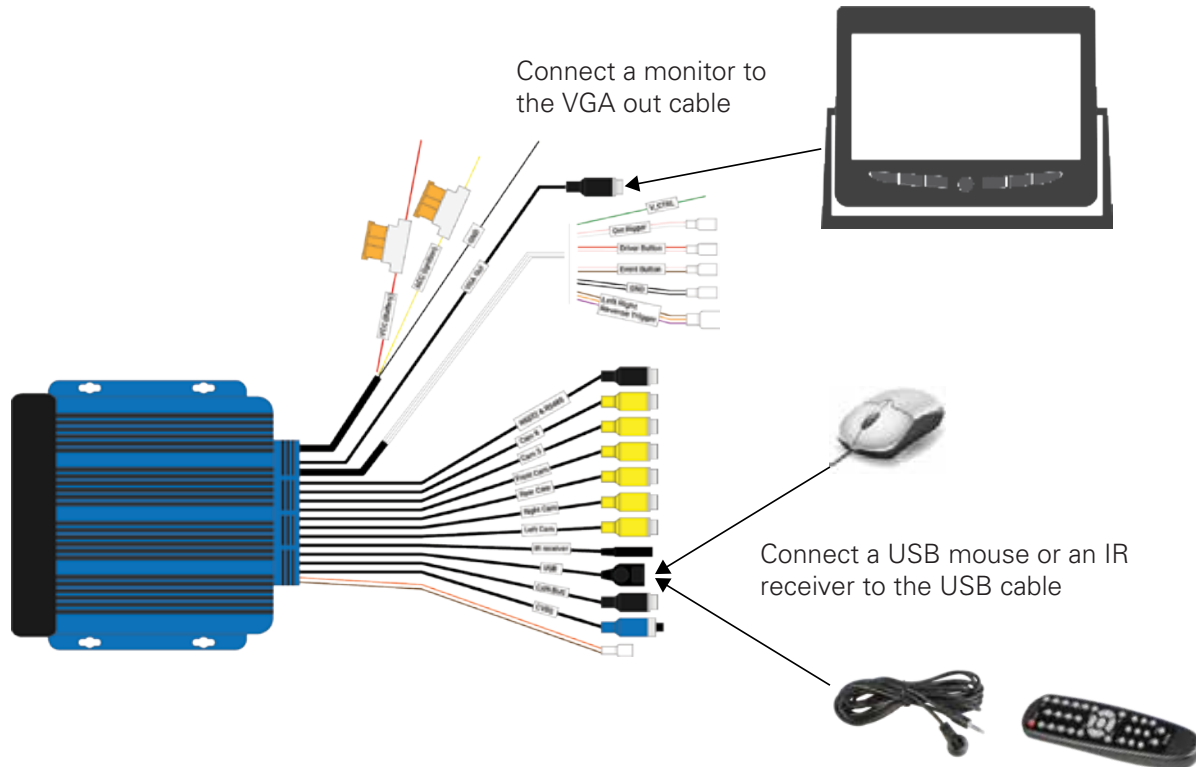
**Connecting Peripherals for Accessing and Navigating the GUI**

You will use either USB mouse or a remote control to navigate the system's on-screen GUI to complete the automatic calibration. To use the mouse, you will directly connect it to the InView 360. To use a remote, you will directly connect an IR receiver to the InView 360.



## Connecting a Monitor

Use the VGA Out connector to connect to a monitor.



## Verifying Calibration Pad Placement

Calibration pads provide reference points for the cameras during the software calibration process. Therefore, it is important that the calibration pads are accurately and optimally placed.

1. Power up the inView 360 HD AVM system.

You should see the simulated 360° image on one side of the monitor, and channel 1 (front camera) on the other



side.

2. Cycle through every camera view by either:
  - Pressing the green **DRIVER/VIEW** button repeatedly, or
  - Pressing the **Arrows** on the remote control

While reviewing the images on the monitor, ensure that the cameras have a direct line-of-sight with the calibration pads.

In this image, you can see that the calibration pad at the left is not placed correctly. It can not be clearly seen as it is behind a door.

The calibration pads should not be obstructed by mirrors, ladders, or any other protruding objects.

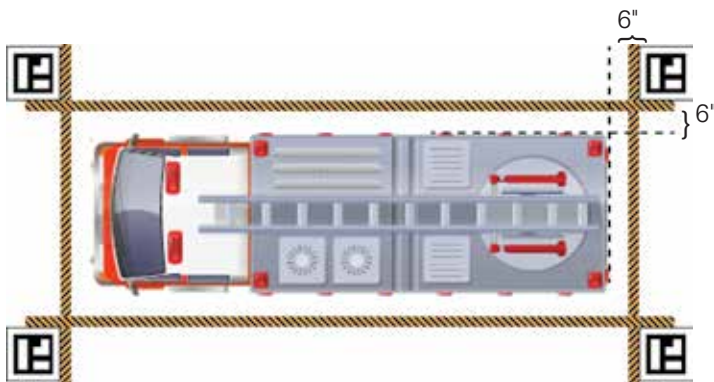


The pads should not be obstructed by mirrors, ladders, or any other protruding objects.

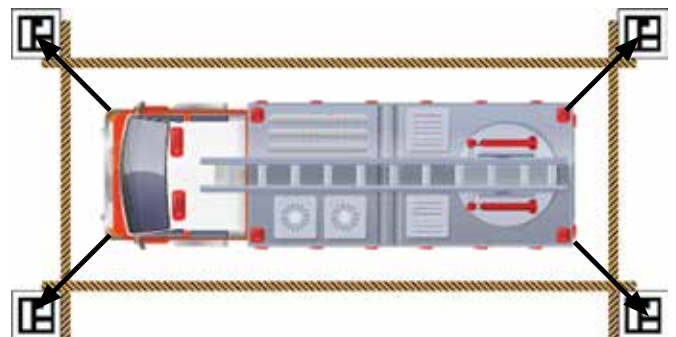
**NOTE: Spacing the Calibration Pads**

For calibration, all four pads must be an equal distance away from the vehicle. So if you move any one calibration pad, then you must move the other three pads an equal distance away from the vehicle. See the example below.

Trial Pad Placement



Optimal Pad Placement



3. Move the calibration pads further away from the vehicle if there is an obstruction blocking the pad in the camera's field of view.
4. Cycle through the images again after you have adjusted the placement of the pads. Verify that the pads are visible and unobstructed.

### Poor Pad Placement

Pad is obstructed by the vehicle door and in shadows.



### Optimal Pad Placement

Nothing obstructing either pad. No shadows.



## Logging In

1. Right-click anywhere on the screen or press **Enter** on the remote, then select **Login**.
2. Select **Yes** when asked if you want to proceed with stopping the recorder.
3. Double-click in the input field to open the virtual keyboard, and then enter the default password: **88888888** (8 number eights).
4. Click **OK** with the mouse or press **Shift + OK** on the remote.

The **Main Menu** opens.



## Automatically Calibrating

1. Click to select **AVM** (or use **Shift** to cycle through options to find **AVM** and then press **Enter** to select), then select **Automatic Calibration** in the **AVM Calibration** menu.

The **Automatic Calibration** window opens.



This window displays the four camera views with a Units Setup configuration window on top.



In this window, you can select the measurement units, and enter the vehicle width and length.

This step is optional.



2. Click **Calibrate** to start the automatic calibration process.

During the process, a series of messages appears on the screen to confirm when each calibration step is complete. If there is a problem with completing a step, a message appears to advise that a problem has occurred.

A message will appear for each camera view announcing the successful completion of calibration for each view, finishing with a message that the calibration was successful.

3. Click **Yes** to complete the procedure. The system outputs the 360 image.

**i NOTE: If Automatic Calibration fails**

In the unlikely event that Automatic Calibration fails, please see the **InView 360 HD Calibration Guide**, document number 700-1216.

## Refining the Calibration

Sometimes the automatic calibration process requires some fine tuning after the process. You might notice that the overlay in the 360 image does not quite match your vehicle's dimensions.

After the automatic calibration procedure is complete, you will have access to the Automatic Calibration configuration window, where you can refine the 360 image. You can do the following:

- Select a vehicle type
- Adjust the vehicle length and/or width
- Rotate the vehicle (similar to horizon correction in cameras)
- Offset the image

### **i** NOTE: When Using a Remote

You'll have to shift through each category and use the arrow buttons to select options if you are using the remote control.




1. Select a **Vehicle Type** from the drop-down menu. These vehicle types are pre-configured for the chosen vehicle's dimensions and shape.
2. Adjust **Precision** field to select the size of the incremental changes that are made when you use the - and + buttons or the Vehicle Rotation arrows.
3. Use the - and + buttons to adjust the **Vehicle Length** and **Width** of the overlay.
4. Use the **Vehicle Rotate** arrows to rotate the overlay to match the vehicle shape.
5. Use the **Up/Down/Left/Right** arrows to correct the **Offset** of the overlay so that it better fits the image.
6. Click **Update** to assign the changes and to update the 360 overview image.
7. Click **Save** if you are satisfied with the overview image.

### **i** NOTE: Adjusting the Points

If you are using a mouse and are not satisfied with the points, you can click **Adjust** if you want to make more adjustments. You will get access to a point-plotting interface. This option is not accessible if you are using the remote.

## Verifying that Calibration was Successful

The final mandatory step for calibrating your inView360 HD AVM system is to ensure that the calibration was successful.

1. Navigate to or back to the **Live** screen. If you are in any of the calibration windows, click the **Back** button  and/or the **ESC** button until you see the **Live** screen.



2. Configure the vehicle to **Full Screen Top** view.
  - If the **Green Driver/View** button is installed, click the button to find the **Full Screen Top** view.

### **i** NOTE: The 6 views

Clicking the **Green** button cycles through the following 6 views: Top + Left, Top + Right, Top + Front, Top + Back, Full Top, and a split view that contains Left, Right, Front, and Back.



- If the **Green Driver/View** button is not installed, then refer to the **Configuring the Default View** section of the **InView 360 HD AVM Configuration Guide (700-1217)**.
3. Inspect the 360 degree image in the monitor.
    - a. Ensure that each of the four mats looks like one contiguous mat with minimal distortion.
    - b. Have someone walk around the vehicle and ensure that you can see at least their feet at all times as they walk around the vehicle, especially in the corners. (The corners are the transition points where the camera images are stitched together.)
    - c. Test drive in a controlled environment (a parking lot, for example) at a low speed to ensure that objects flow smoothly through the transitions.

### **i** NOTE: Addressing Issues with the Transitions

If you observe any issues with the transitions, you might have to do one of the following:

Adjust the blend angles

Try manual calibration (see the **InView 360 HD Calibration Guide**, document number 700-1216)

## Support Information

### Contacting FRC (Fire Research Corporation)

#### FRC Customer Service and Product Support:

(8am to 5pm EST weekdays)

- Main Phone: 631.724.8888
- Fax: 631.360.9727 (24 hours)
- Email: [service@fireresearch.com](mailto:service@fireresearch.com)

If your inView 360 HD system needs to be returned, please contact FRC Technical Support, and provide the model and/or serial number of your unit. Ask for a Return Merchandise Authorization (RMA) number. An RMA number allows the Service Technicians to better track your product when it comes in for service. Please show the RMA number on the outside of the package. ANY RETURNED PRODUCT WITHOUT AN RMA NUMBER MAY BE REFUSED.

## Product Information

For product information and documentation related to the inView 360 HD system, please visit the inView 360 HD product page on the FRC website: <http://www.fireresearch.com/>. This product page can be found under the **Video** top level menu header, and then the **inView 360 HD** page is located under the fly-out submenu. Contact information can be found under the **Contact** menu item, and then from the Contact FRC fly-out submenu item. This Operation Guide and the rest of the inView 360 HD video manuals are linked as PDFs on the left side of the product page. Also, these manuals are available on the Manuals page (under the Video header), which is located under the Resources menu item, and then the **Manuals** fly-out submenu item.

## Warranty

Complete warranty details are available online on the FRC Limited Warranty page. This page can be found through the above link for the FRC website. Go to the Manuals tab (under the Resources menu item), and then scroll all the way down to the bottom of this page. There is a link for the [Warranty Policy](#) PDF under the [Reference/Data Sheets](#) header.