Video Management Software (VMS) for HD5/SD/DR, July, 2018

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1 VMS Overview

The Video Management Software (VMS) allows access to live or saved mobile surveillance video.

Driver and passenger behavior video footage and vehicle data can be retrieved and viewed.

Video of the past and present location of a vehicle, and information on the intended trip and destination of the vehicle, can be accessed and reviewed.

The layout of the video can be adjusted to provide a multitude of vantage points of the driver, passengers, and trip path of the subject vehicle.

Vehicle status information such as speed, rate of acceleration, system voltage and the temperature of the DVR can be displayed in a table and illustrated on a graph.

The path of the vehicle as it travels on its designated trip can be tracked on an interactive GPS map that can be displayed with the array of video windows.

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1.1 Hardware Requirements

Minimum requirements to enable VMS to operate:

- Operating System: Windows 7 / Windows 10
- Processor: Core i3 CPU or better
- RAM: 4GB or better
- Hard Disk Space: 300 MB for software, 100GB or more for video
- 10/100 Base-T Network Interface Card / Controller
- One USB 2.0 Controller
- DirectXc-compatible sound card
- Video Card: 256 MB nVidia GeForce GT220 OR AMD HD4670 or better
- Resolution: 1280X768 32k colors or better
- DirectX 9.0c

Recommended requirements to enable VMS to operate at an optimum level:

- Operating System: Windows 7 / Windows 10
- Processor: Intel Core i5 CPU or better
- RAM: 8GB
- Hard Disk Space: 300 MB for software, 500GB or more for video
- 10/100 Base-T Network Interface Card / Controller
- One USB 3.0 Controller
- DirectXc-compatible sound card
- Video Card: 512 MB nVidia GeForce GTX460 or AMD HD6850 or better
- Resolution: 1920x1080 32k colors or better
- DirectX 9.0c

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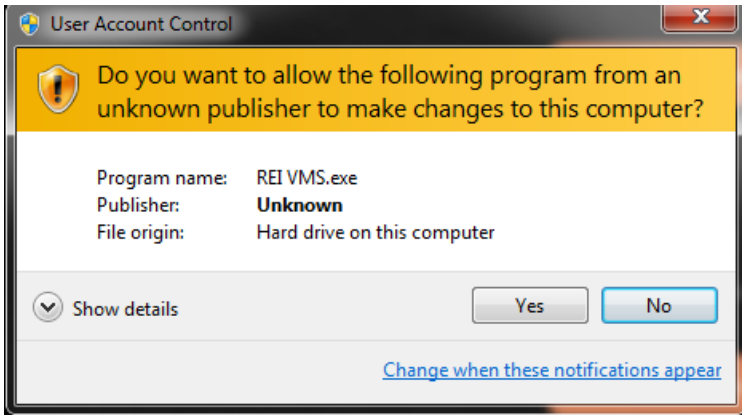
2 Software Installation Instructions

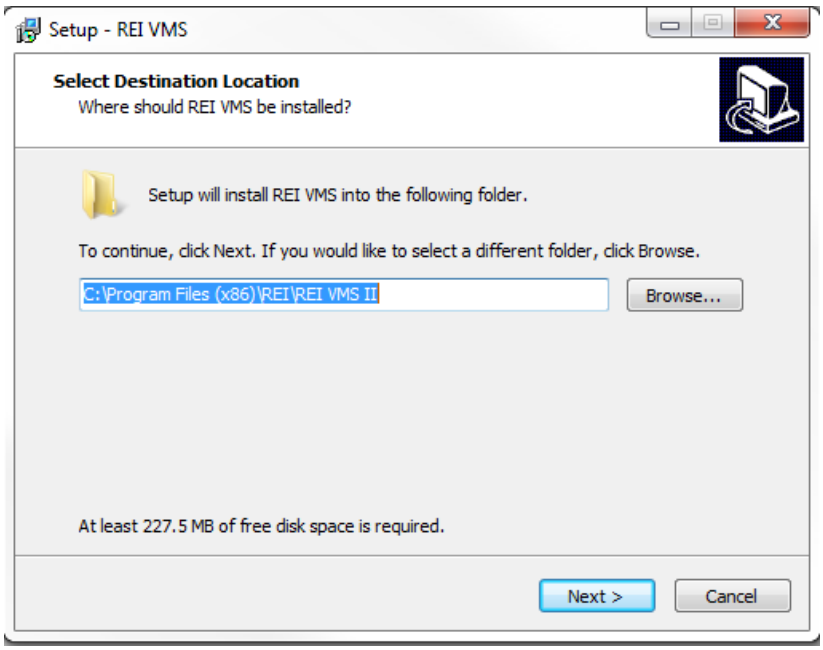
Perform the following to install the REI VMS application:

Step 1: Locate the installation program 'Setup REI VMS.exe' at radioeng.info and double click the icon.

If the User Account Control screen appears, click 'Yes.'



Step 2: Choose where to install the VMS application. It is recommended that the default location is selected and click 'Next.'



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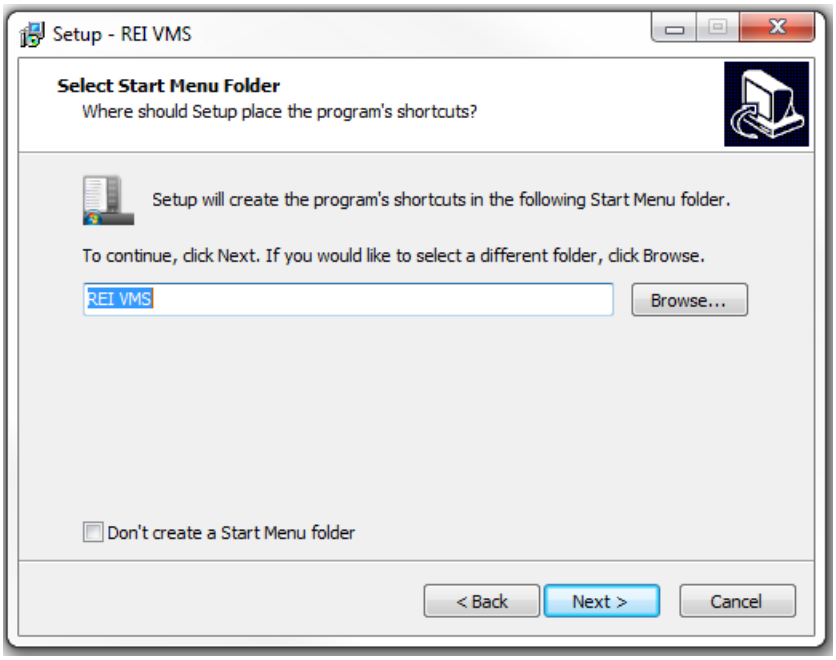
Step 3: Choose the name of the application in the Start Menu. It is recommended to use the default name and click 'Next.'



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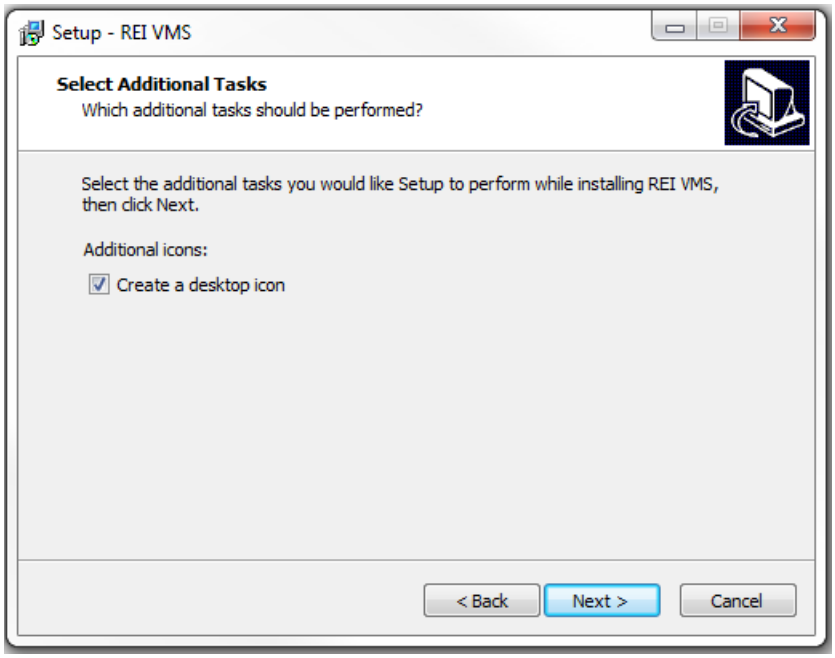
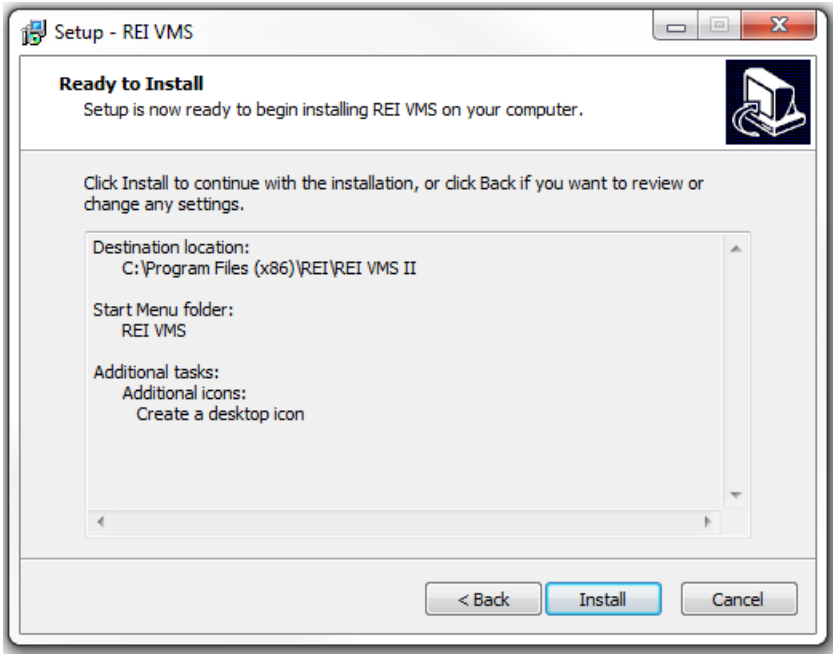
Step 4: Select whether to create a desktop shortcut for the VMS application. It is recommended to follow the default setting and leave the 'Create a desktop icon' checked and click 'Next.'



Step 5: The REI VMS application is ready to install. Click 'Install' to begin installation.



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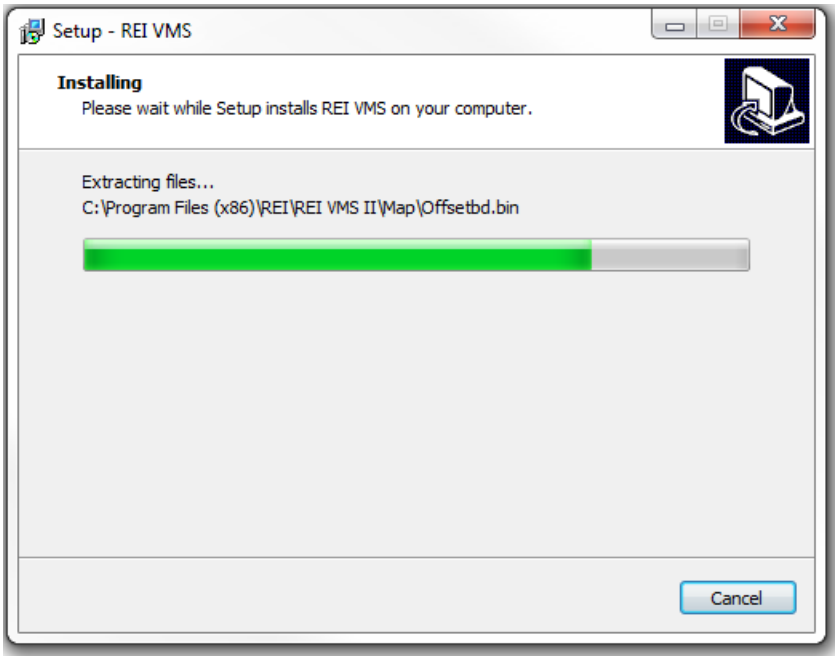
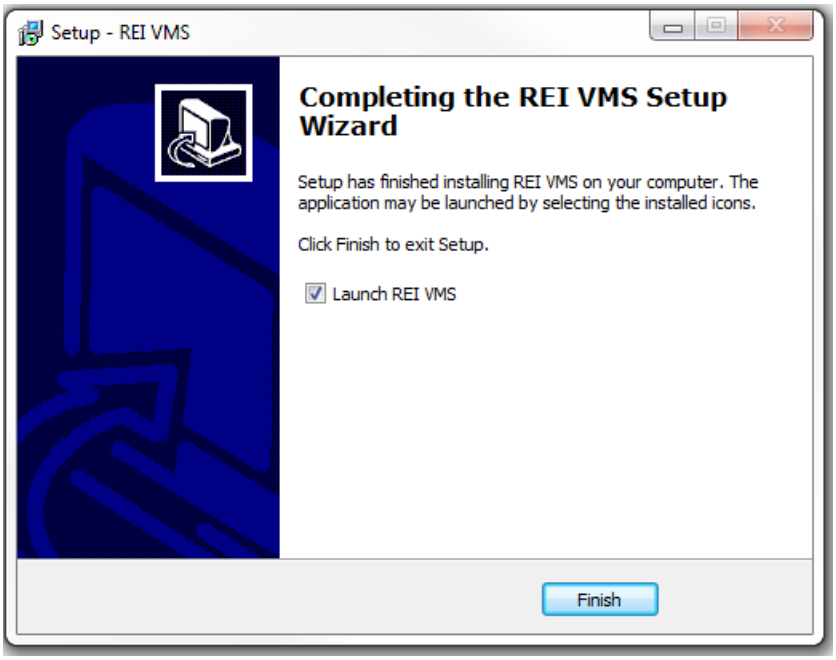
Wait for the installation to complete. A status bar will indicate installation progress.



Step 6: Once the installation has completed, click 'Finish' to exit the installation process. By default, the 'Launch REI VMS' is selected to open the REI VMS application.



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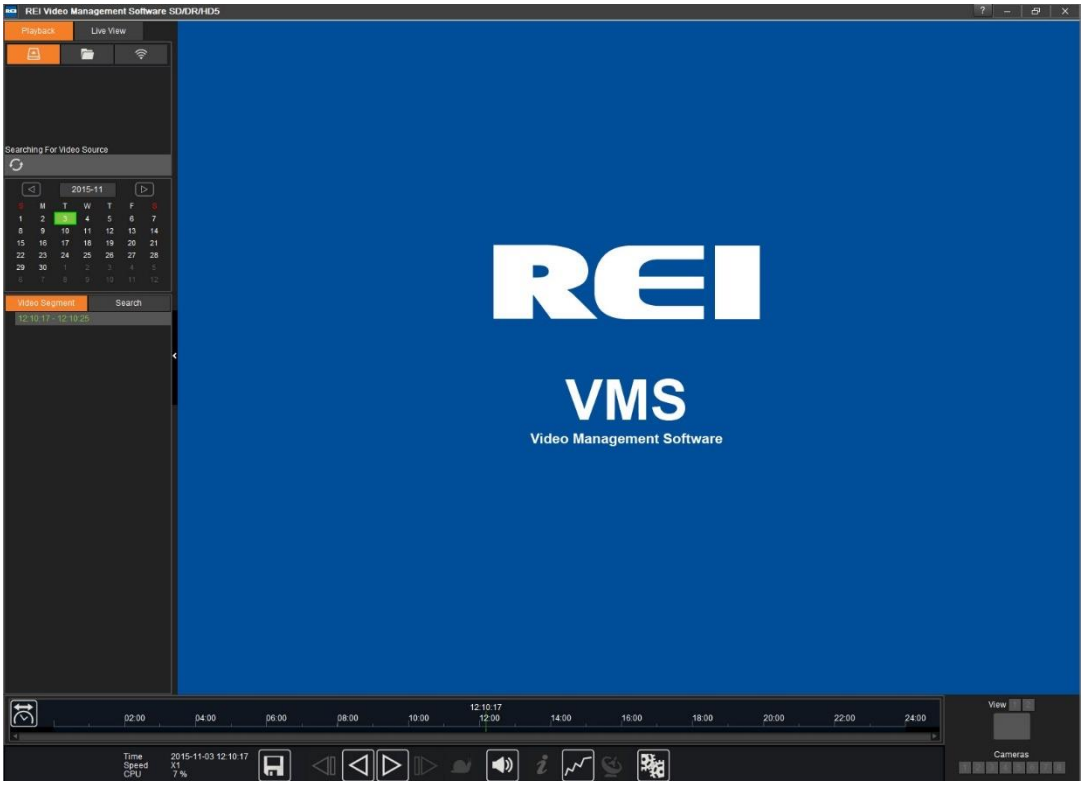
Once the VMS installation is complete and the VMS application has been launched, a desktop icon can be double-clicked to open the VMS application.

If assistance with installation, setup, configuration or other technical support is necessary, contact one of the Radio Engineering Industries, Inc. support technicians at (877) 726 – 4617 or (402) 339 – 2200.

3 VMS Layout

Upon initialization at installation, or double-clicking the desktop icon to open VMS, the following window appears and use of the VMS application can begin:



Initial VMS window

From the initial window, the user can select to review Playback video or video from Live View. Playback video is sourced from a SD flash card or a hard drive removed from the DVR on board the vehicle.

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Playback video can also be accessed from a local hard drive and played. Another method is accessing and viewing video from a remote connection.

Live video can be accessed from Live View. From Live View, video from multiple DVRs can be played simultaneously. Refer to Section 15, Live View, for information about playing video from Live View.

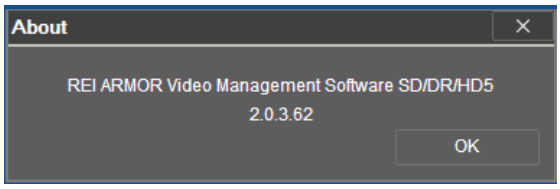
VMS header function keys

When the VMS window view is maximized, the function key bar changes to enable the window to be reduced. When the window is minimized, the function key bar changes again to enable the window to be expanded to the maximized view.

Maximized View

Minimized View

Group of keys in the upper right corner of the VMS window used, from left to right, to indicate the version of the VMS application, minimize the window, alter the size of the VMS window, and close the VMS window.

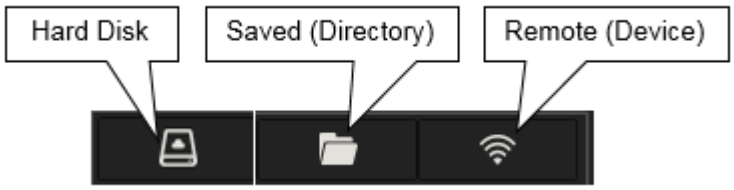


Version of VMS Software

4 Selecting Your Playback Source

From the Playback source mode, recorded video can be accessed and watched from three different sources: Hard Disk, Saved (Directory), and Remote (Device). There are unique aspects for each of these sources, but much of the functionality is interchangeable between them.

Note: The names in parenthesis are the names that appear when hovering over the Playback icons.



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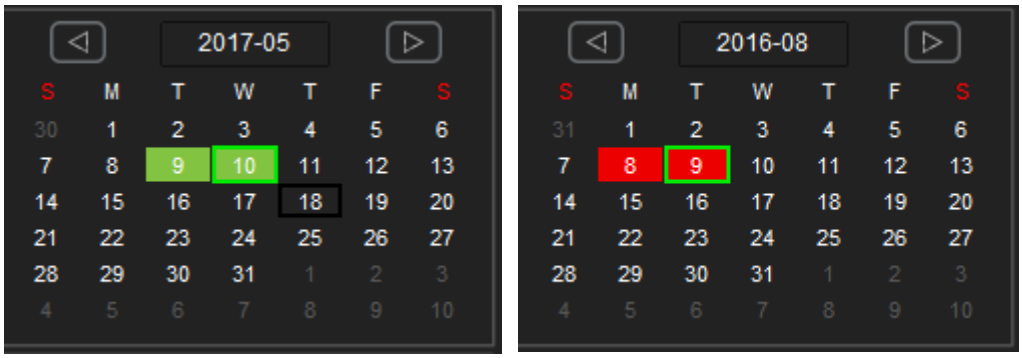
5 Selecting and Playing Your Video

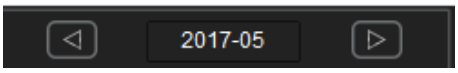
The calendar is used to select the date and time of the video for the subject vehicle. The neon green border surrounding the date indicates the selected day for viewing video. Days that are not highlighted with a colored box indicate there is no video available for that day. Green boxes highlighted over a day on the calendar indicate normal video is available for that day. If the box is red, alarm video is available (i.e., speeding). A yellow box for the day indicates a sub-stream video is available for that day.



Calendars with normal and alarm video

Month Selection Bar

Clicking on the left and right arrows moves the month selection forward or backwards in one-month increments.



Clicking on the year-month in the center of the calendar opens a window providing a list of the video available for the year and month.

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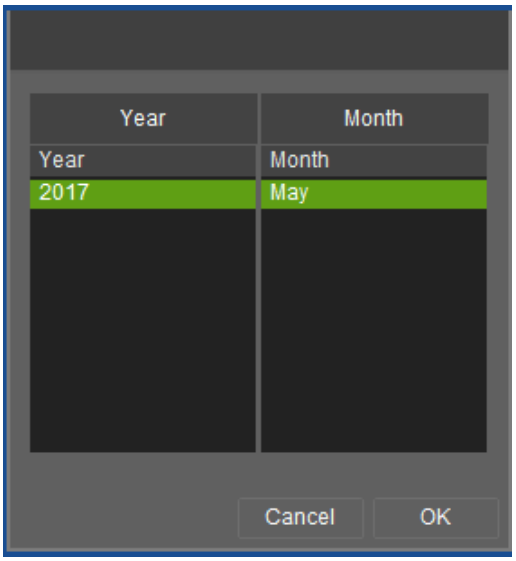
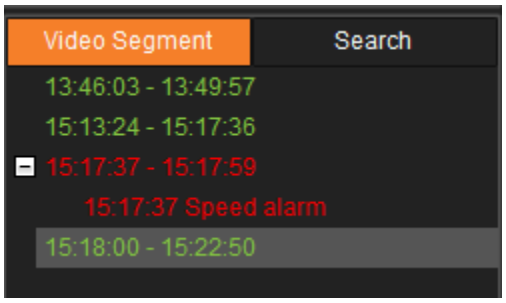


List of available Video

Video Segment

After VMS has completed searching for recorded files, a listing of available video segments is listed under the Video Segment column below the calendar.

A Video Segment is a listing of video recorded for a selected date for the vehicle.
Video segments are characterized by color. If a video segment is green the video is normal. Alarm video segments are red and a reason for the alarm is stated after clicking on the drop down next to the video segment listing (i.e. Speed alarm). Alarm video will play in its entirety and not just for the duration of the alarm portion of the video.



Video Segment

5.1 Playing Video from Hard Disk or SD Card Source

Selecting the hard drive icon on the Playback option menu opens an HDD directory tree listing vehicles available with video that can be selected and played from a previously connected hard drive or a

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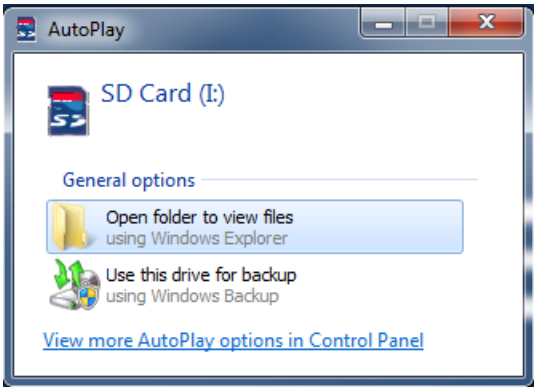
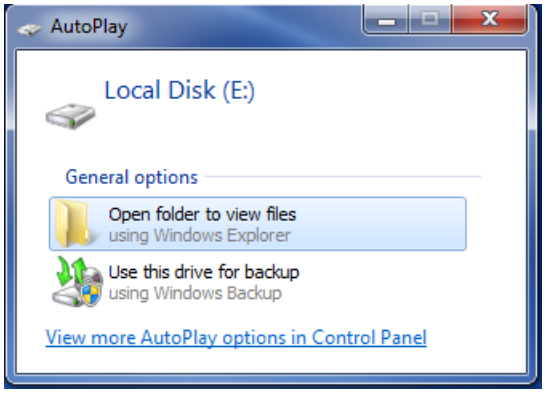
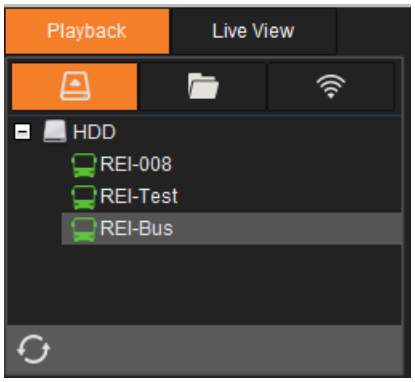
previously inserted SD flash card. Inserting the SD flash card into the PC or laptop prompts the user with an option to open the folder to view the video on the SD card or local disk. If these boxes appear, disregard them and click on the '**X**' to close the boxes.







Playback, hard disk selected

Click on Playback followed by clicking on the Hard Disk icon. From the directory tree, double-click on the selected vehicle icon to access the video that is available for viewing (i.e. REI-Bus).

Playback Tool Bar

There are three different Playback tool bars with functions available dependent upon which Playback option is selected. For video played from hard disk, the following playback tool bar, with refresh screen capability, is displayed.

Hard Disk Playback function

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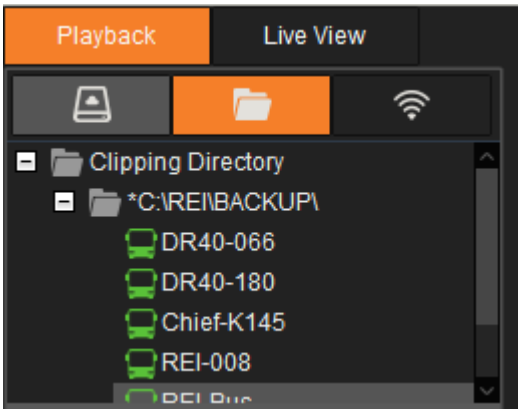
5.2 Playing Video from Saved (Directory) Source

Selecting the Saved (Directory) icon on the Playback option menu opens a Clipping Directory with folders listing vehicles with video available from the local hard drive. This is saved video that can be selected from a directory tree and played. From the directory tree, double-click on the selected vehicle icon to access the video that is available for viewing (i.e. REI-Bus).

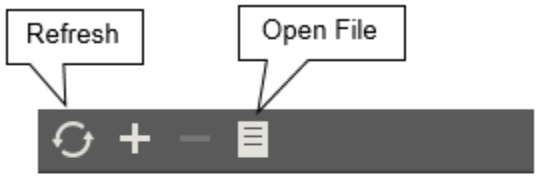


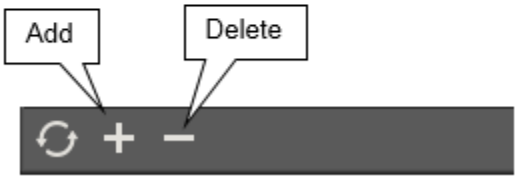
Playback menu, Saved Source selected

Directory Tool Bar

There are three different Playback tool bars with functions available dependent upon which Playback option is selected. For video played from a local directory, the following playback tool bar, with refresh screen capability, add/delete, and open file is displayed.

Tool Bar for Directory mode





Refresh: Click to restore the Clipping Directory to its previous state.

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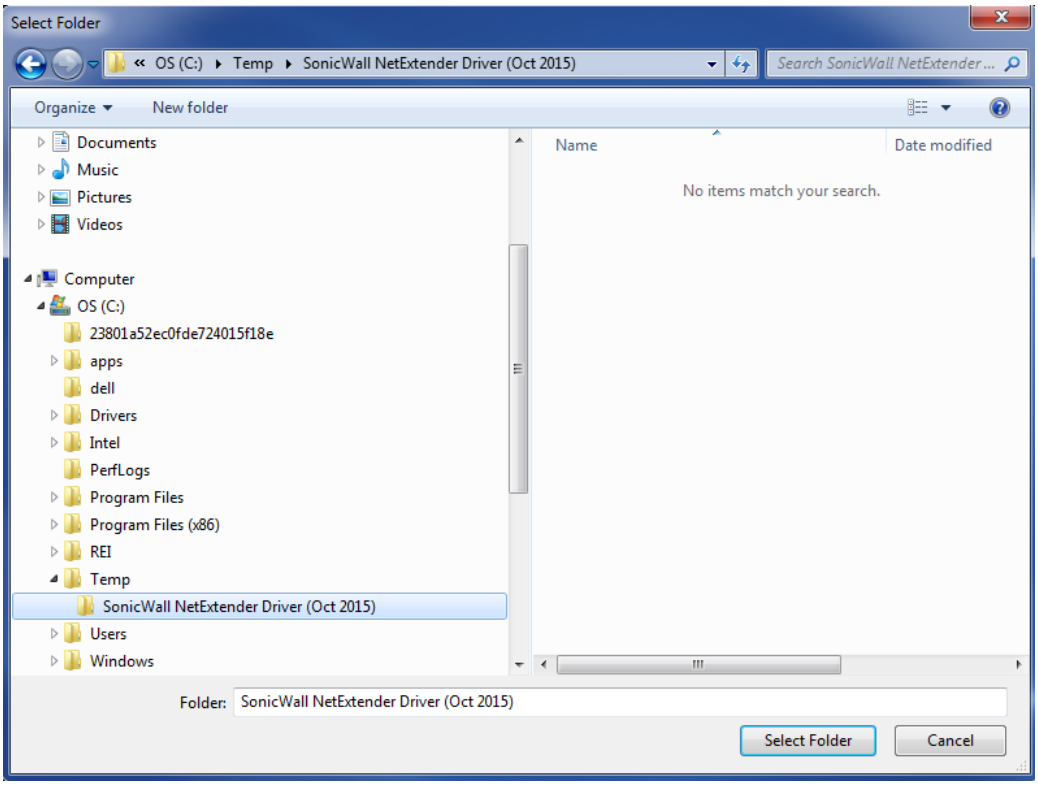
Open File: Use the open file function to browse the directory to locate a video from a source folder.

Add: Opens a Select Folder window where a saved video file from a source folder can be selected and added to the Clipping Directory. Perform the following to add a file to the Clipping Directory:

Click the Add key that opens the Select Folder file.

From within the Select Folder browse for the file to add to the Clipping Directory (i.e. SonicWall NetExtender Driver (Oct 2015)).



Select Folder window, Open file window similar

Click 'Select Folder' and the folder is added to the Clipping Directory. (i.e. C:\TEMP\SONICWALL NETEXTENDER DRIVER OCT 2015).

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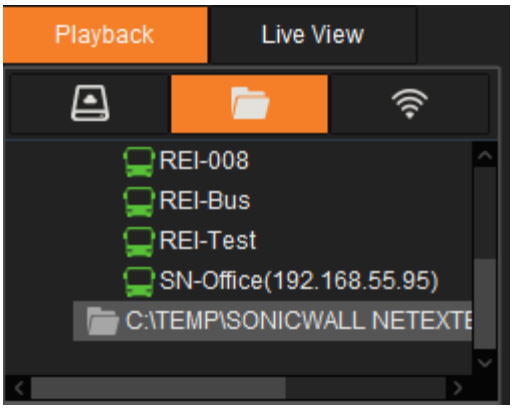
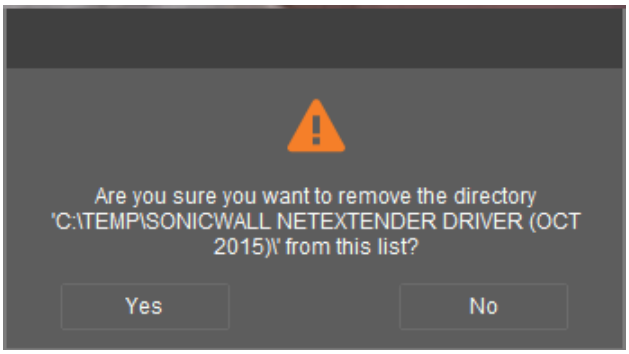


New file added to clipping directory

Delete: Clears a folder or file from the Clipping Directory. Perform the following to delete a folder from the Clipping Directory:

Click on the folder to be deleted (i.e. C:\TEMP\SONICWALL NETEXTENDER DRIVER OCT 2015).

Click the Delete key and a confirmation message appears. Click 'Yes' to remove directory. Click 'No' to not remove the directory.



Directory confirmation message

5.3 Playing Video from Remote (Device) Source

Selecting the Remote (Device) icon on the Playback option menu opens an Auto Directory tree listing the number of vehicles available with video. The I.P. address for each vehicle with video is in parenthesis. This is video that can be selected from the directory tree and played from a remote source by double-clicking the selected vehicle icon in the directory.

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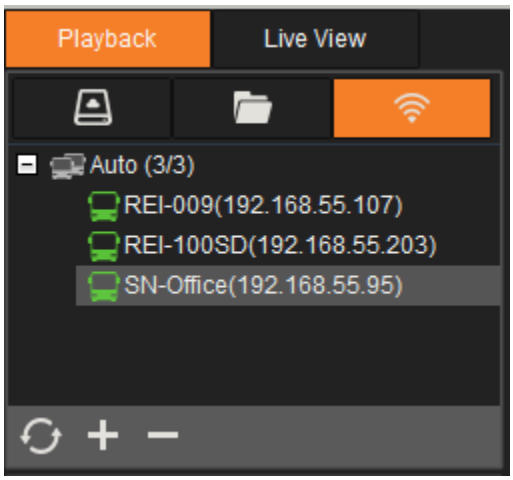

Playback menu, Remote Source

Remote (Device) Tool Bar

There are three different Playback tool bars with functions available dependent upon which Playback option is selected. For video played from a remote, or device, directory, the following playback tool bar, with refresh screen capability and add/delete is displayed.

Tool Bar, Remote Source

Refresh: Click to restore the Clipping Directory to its previous state.

Add: Enables a saved video file from a source folder to be selected and add the video to the Auto Directory from an 'Add a Group' dialog box.

Click Add to open the 'Add a Device' dialog box.

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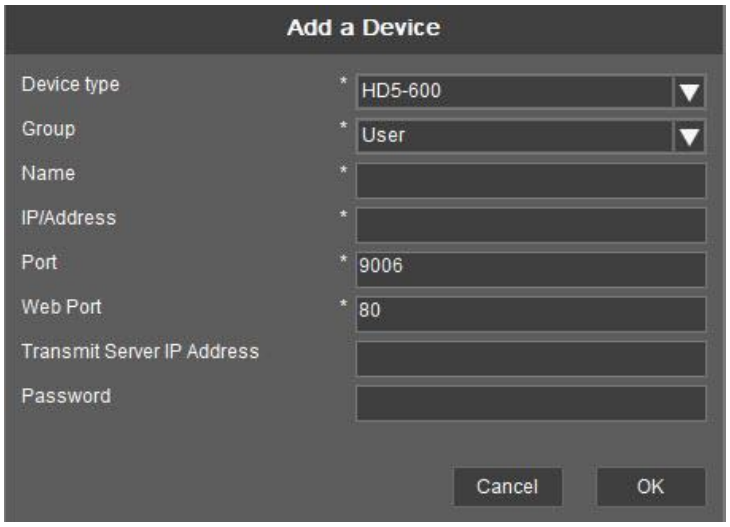


Add a Device dialog box

Within the Add a Device dialog box the rows with an asterisk ***** requires an entry.

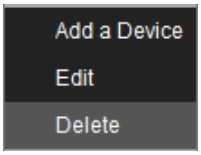
Device type: Select from the drop down to select the device.

Select from Device drop-down menu.

Group: Enter the name of the group to add to the directory (i.e. test) or select an existing group from the drop-down.
Name: The name of the vehicle video in the group (i.e. REI-009).
IP Address: The Internet Protocol address or the DNS of the device being added (i.e. 192.168.55.111). The entry of an URL for a dynamic DNS device for use with a DVR is also allowed (i.e. bus125.radiodvrs.com).
Port: Identifies the port where video to the device enters/exits (i.e. 9006).
Web Port: Identifies the web port used for the device (i.e. 80).
Transmit Server IP Address: External IP address used to receive transmitted video between the server and the client device.
Password: Enter to secure access to device.

Delete Device

Right click on the device (i.e. 192.168.55.111) and select 'Delete' from the drop-down menu.



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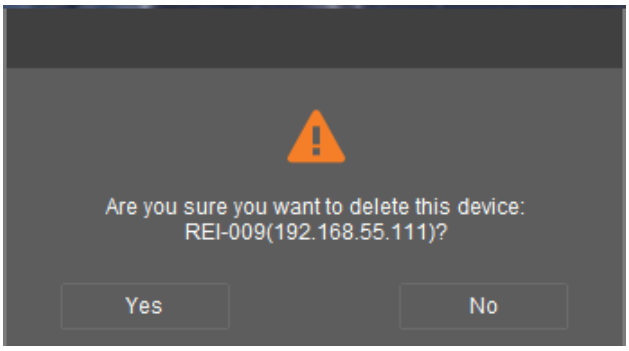
A confirmation message appears asking to continue the deletion.

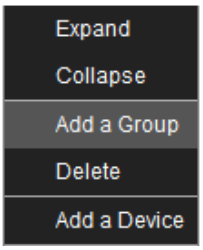


Delete Device confirmation

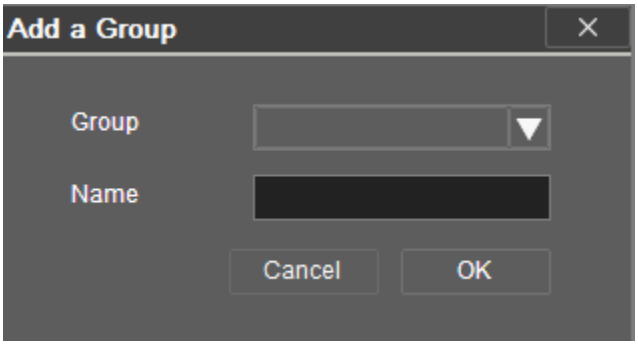
Click 'Yes' to remove the device. Click 'No' to not remove the device.

Add a Group

An additional group can be added to the directory by right clicking on the top group listed in the directory.



Select Add a Group to open the 'Add a Group' dialog box.



Add a Group

Group: The folder in the directory where an array of vehicle videos is listed.

Name: The name of the vehicle video and its I.P. address included in the group.

Click the Delete key and a confirmation message appears. Click 'Yes' to remove directory. Click 'No' to abstain from removing directory.

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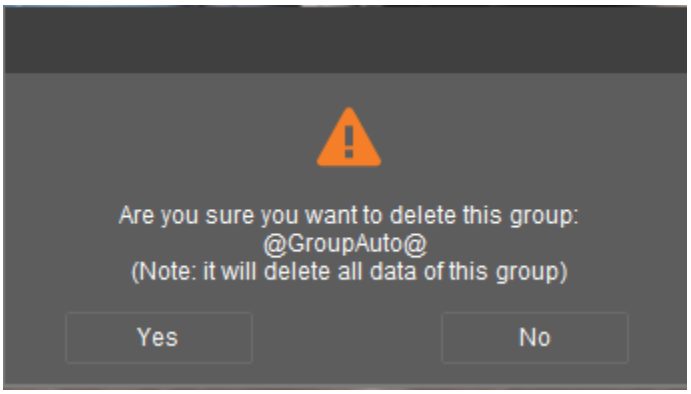
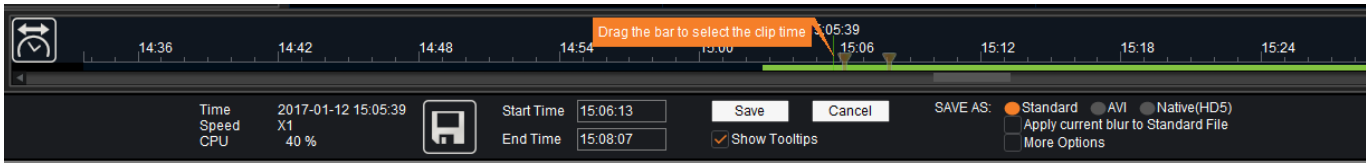


Delete Group confirmation

Note: The VMS software functions the same operating from a remote (device) playback source as it does from a hard disk playback source.

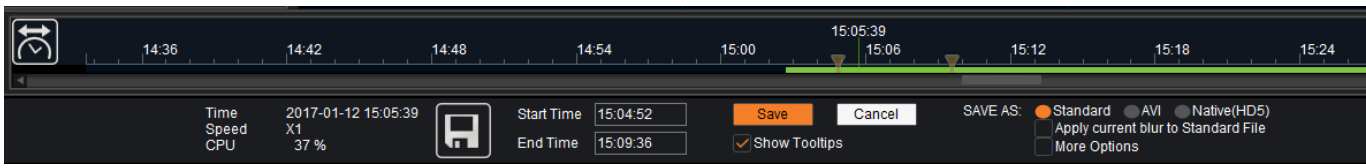
6 Saving Video

Save (Sometimes referred as Clip): Click to save a segment of video. Video segments can be saved to a local hard drive. The start and end time of the segment of video to be saved can be entered manually by dragging the bars on the time scale. This is known as time boxing. Drag the first bar on the time scale to set the start time and drag the second bar on the scale to set the end time of a segment of video to be saved.



Time boxing

Another method of selecting a video segment to save is entering the start time and end time of the saved video clip in the ‘Start Time’ and ‘End Time’ entry boxes to the left of the Save key.



Manually enter the start and end time of saved video

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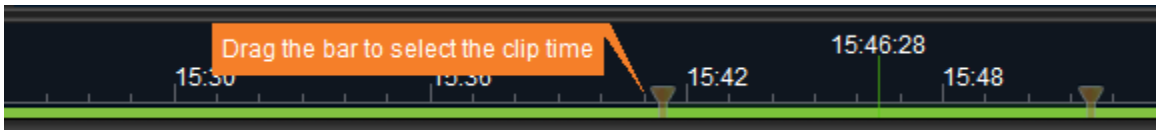
Show Tooltips: Click on this check box to show the flag instructing to drag the time scale bar to select the start and end clip time. The flag is hidden when the check box is cleared.



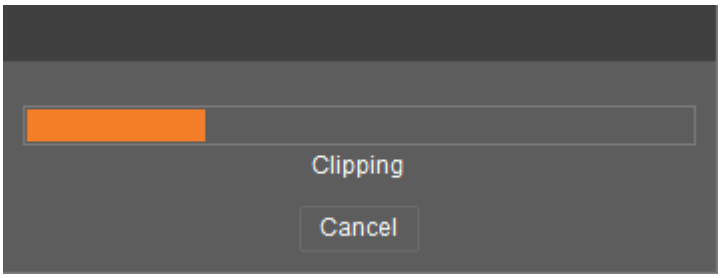
Tooltip flag

Note: If 'Save' is selected while video is playing, the video stops playing.

Save options are Standard, AVI (Audio Video Interleave), and Native (HD5).

Standard: The video is saved to a local computer hard drive making the video easily accessible in VMS on the local machine. This is the default save option. This save method, accessed via the 'Folder' tab, allows for a video to be copied to the computer's hard drive and stored until needed. Video will behave similarly to as if it were being played off a hard drive, with all video, sound, metadata, and controls available.

After entering the start time and end time of the video to be saved, click the 'Save' button. The following 'Clipping' or save progress bar appears as the video is saved. Click the 'Cancel' button to end the attempt to save video.



Saving Video segment

When the video is saved, the following message appears to confirm the process is completed. Click 'OK' after the 'Standard clipping complete' message appears.

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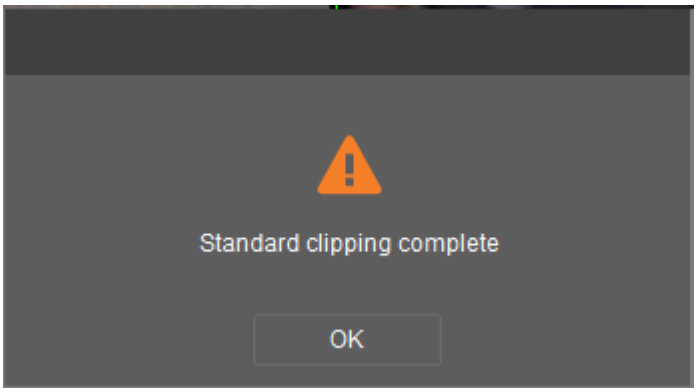
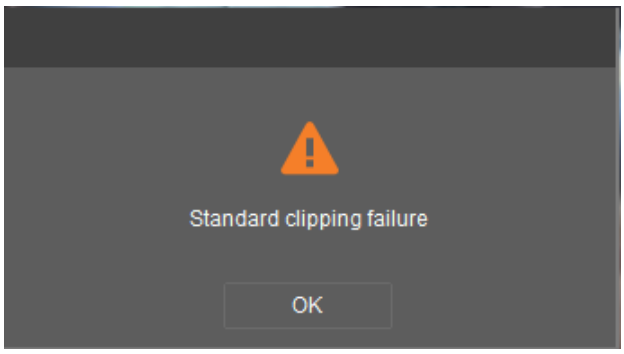


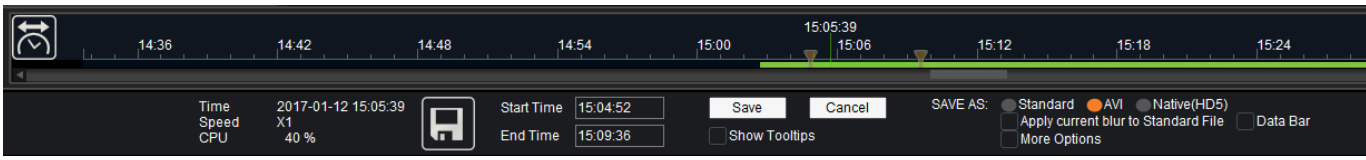
Saving process completed

If the attempt to save the video clip fails, the following message appears.



Video clipping failure message

AVI: Use the AVI method when sharing with someone that does not have VMS installed. This will output all selected video channels into a single, shareable AVI file that can be played in any video player, such as Windows Media Player. AVI files contain audio and video data in a single bundle that allows synchronous audio accompanied with video playback. The converted video segment is saved to a sub folder identified as CONVERT in the saved video location folder (i.e. C:\REI\).



Saving with AVI selected

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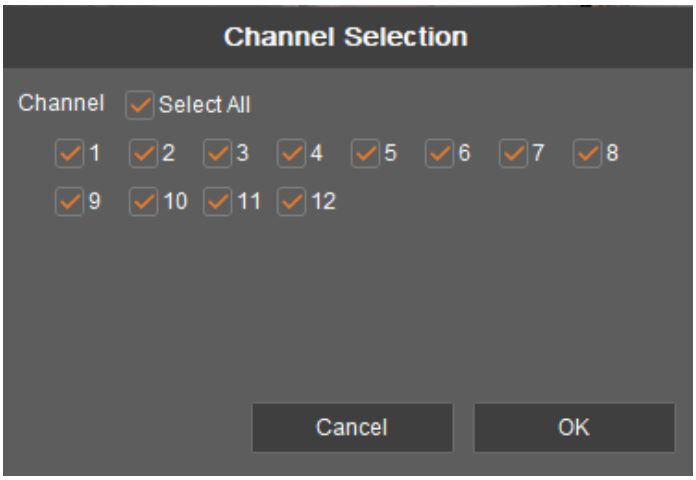
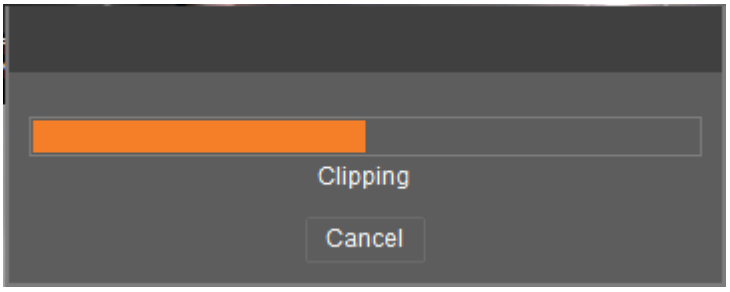
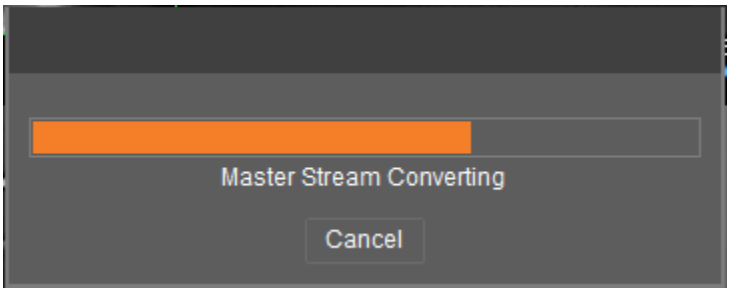


Select Channels, click OK



Saving video in AVI format



Master Stream Conversion

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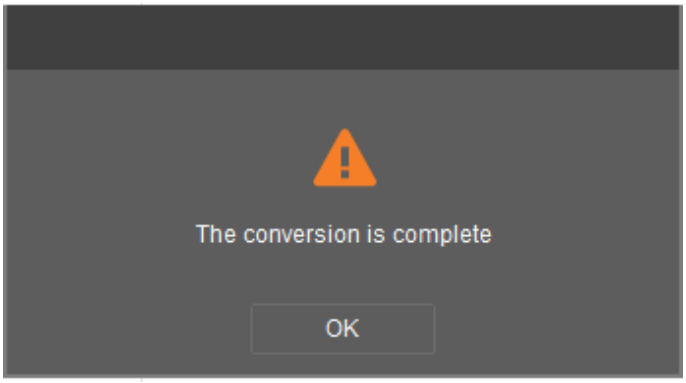
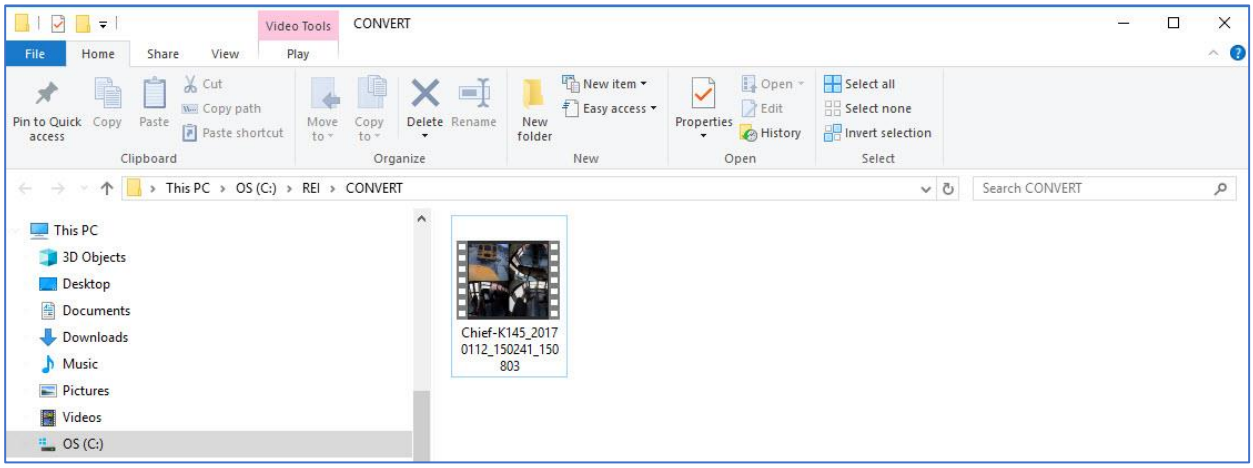


Master Stream Conversion completed



Converted AVI Video Segment Saved in CONVERT Folder

The converted AVI video is a multi-channel/single file that enables the user to view multiple channels from an individual file. For example, a multi-channel/single file video from a school bus can encompass multiple camera views from the inside and outside of the vehicle simultaneously as depicted below.

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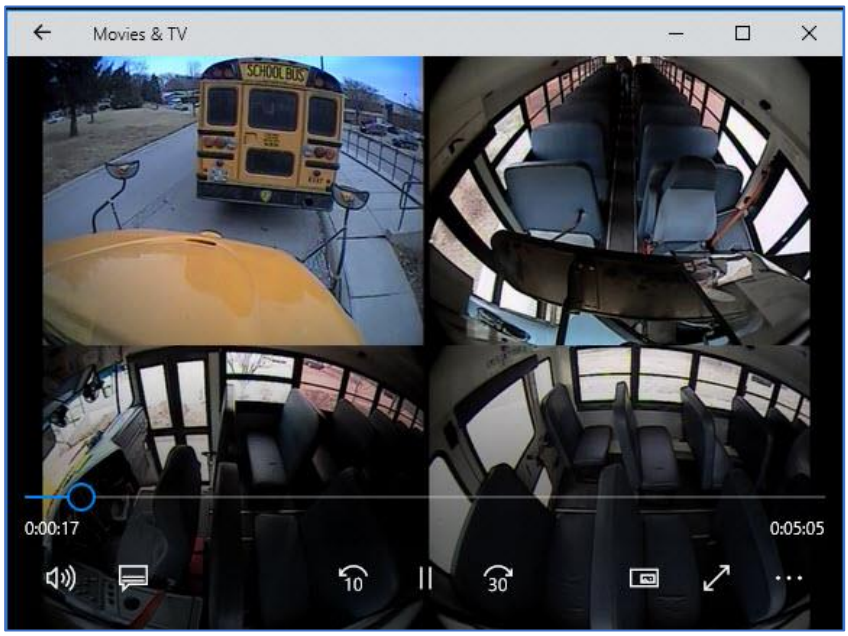

AVI Multi-Channel/Single File Video

Data Bar (for AVI only): Click this check box to include data associated with the video when the video is converted to AVI format. Information such as vehicle identification, vehicle speed (in mph), vehicle GPS location, Frame Info inputs (i.e. RW, SA, FD, IGN) and the data and time of the video are displayed at the bottom of the channel. This allows data to be shared with those who do not use VMS and play the converted video.

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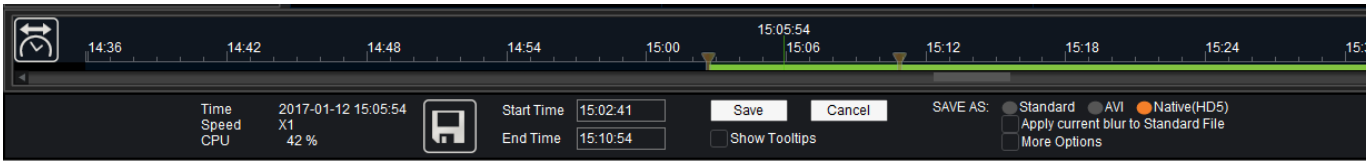
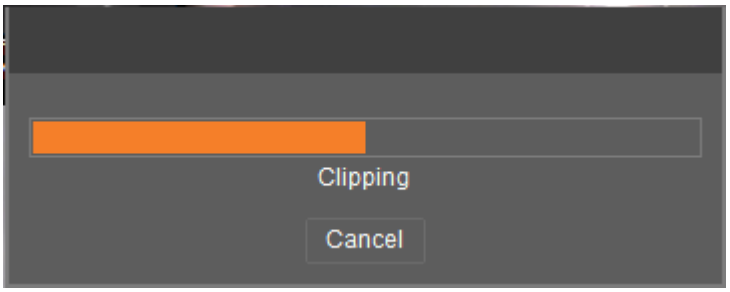
AVI-converted video displaying Data Bar information

Native (HD5): The video, or selected video segments, are exported into HD5 format. The HD5 video segment is saved to a Media File in the saved video location folder (i.e. C:\REI\HD5).

Sharing via the Native (HD5) file format is an easy way to share a video clip between computers that both have VMS installed. All video, metadata, and blur information are included in the HD5 file. Video will play from within VMS and will allow for all normal controls as if playing off a hard drive.



Saving with Native HD5 selected



Saving video in Native HD5 format

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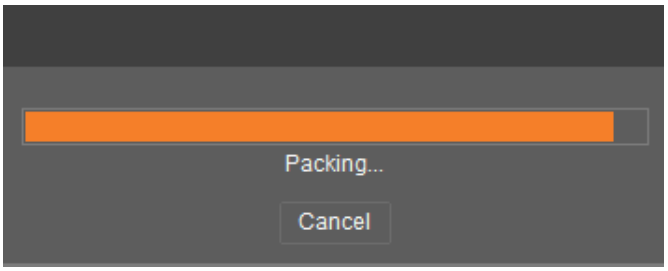
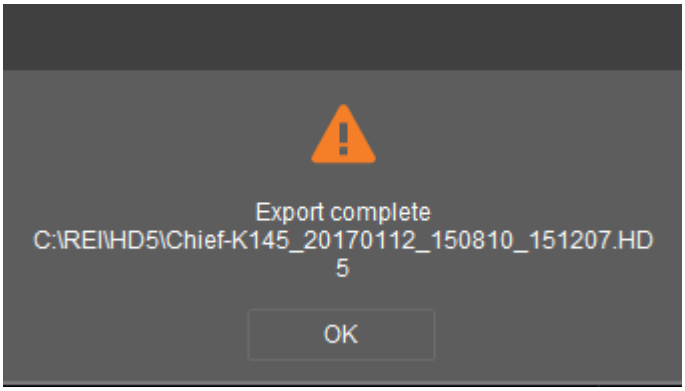


Packing files to Native HD5 format



Native HD5 Export complete

Quick and easy access to the video without having to install the VMS program can be achieved by simply downloading the REI Miniplayer zip file. The REI Miniplayer allows the playing of the HD5 video files and is available on the radioeng.info site: http://www.radioeng.info/series_sd.html

Apply current blur to Standard File: Click this check box to carry over the blur settings with the video as it is exported.

More Options: Click this check box and click 'Save' to open a Clip Setup dialog box. The Start Time and End time of the saved section of video can be entered with a custom start/end range of time, individual channels can be selected, and blur options can be applied.

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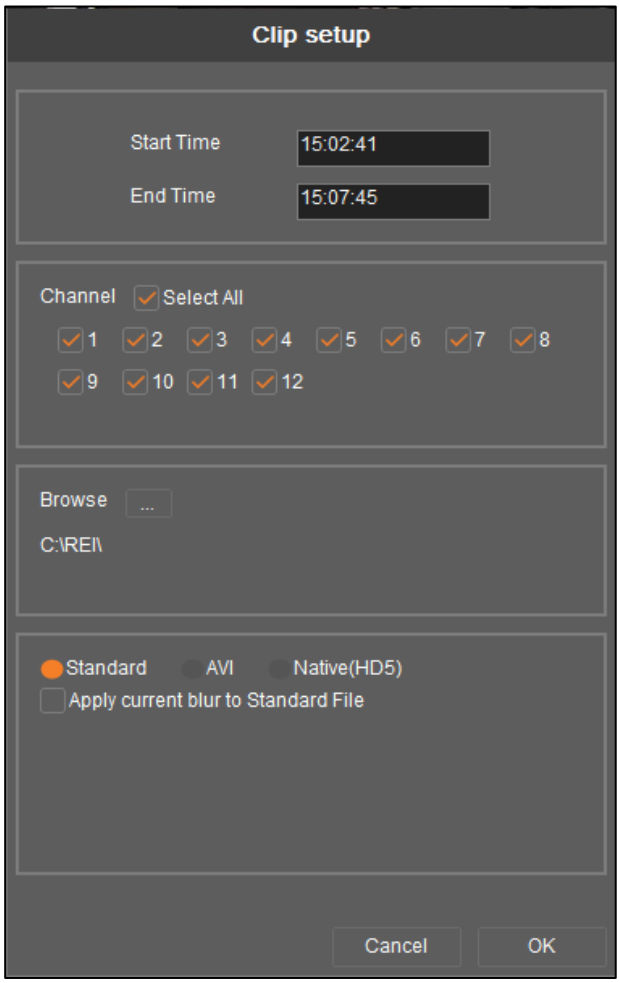

More Options, Clip setup

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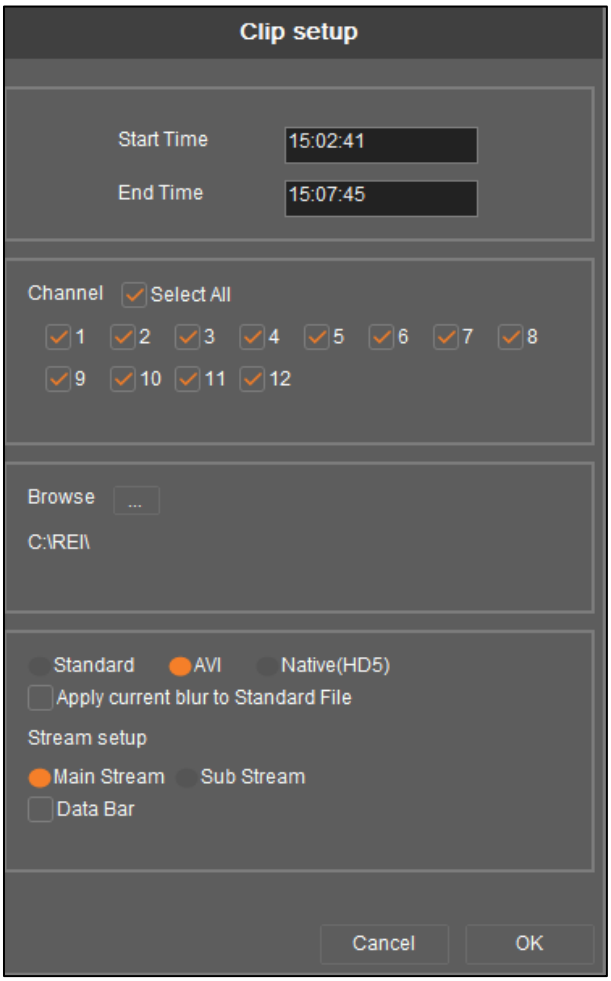

Clip setup for AVI

Stream setup: Applicable to AVI only. Select 'Main Stream' or 'Sub Stream' radio buttons to have the video play in either in mainstream or sub-stream mode.

7 Time Scale

Use the time scale to select video to be watched, saved, or to display what section of video is being played.

Time Scale

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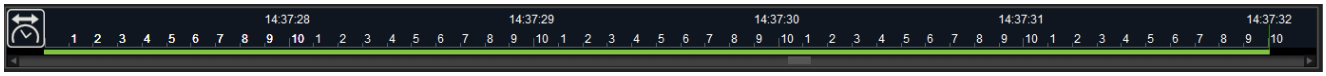
Click the time scale key to toggle between time spans. There are four different time scales incremented over a 24:00 military time format (24-hour, six hour, one-hour, and 10-minute).

Time Scale Key

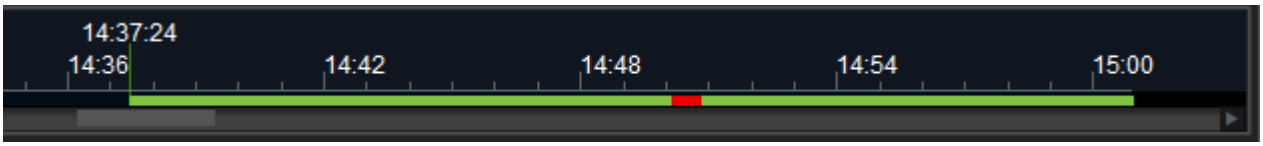
The time increments can be adjusted from hour increments, down to a tenth of a second increment, by rolling the mouse wheel.



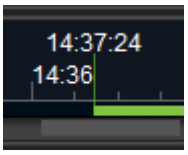
Time Scale in 10th of a second increment

Every video listed under the Video Segment is represented on a bar that covers the time scale. Normal video is depicted with a green bar and alarm video is depicted with a red bar. For the duration the video plays, the elapsed time of the video as it plays matches the elapsed time on the scale. If a channel displays the elapsed time of the video, the elapsed time on the time scale matches the elapsed time displayed on the channel.

As video plays, the bar that represents the length of the video streams along the scale.



A vertical bar displayed with the beginning time of the first video listed on the Video Segment list, can be dragged along the scale to zoom in to play a specific segment of video. Once the bar is released, the video will play from the time that the bar was dragged and released to.



Click on and drag the vertical bar to the specifc section of video to be viewed.

8 Main Control Keys

When the video starts playing, a set of Main Control keys can be used to manipulate the display of the video, how slow or fast the video plays, the sound can be controlled, the video can be advanced frame by frame, and the user can select rewind or fast forward. Also, from the Main Controls additional information, such as a GPS map showing the route of the vehicle, can be displayed with the video.

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Use the Main control keys to determine how the video will be played and displayed. The basic user functions of playing video, pausing video, sound, rewinding and forwarding video are coupled with additional features that provide an enhanced level of information about the vehicle and driver performance associated with the video.

The display of the Main Control keys is different from Playback to Live View and from whether video is being played. The keys are depicted in the following examples.

Main Controls, Video Playing

Main Controls, prior to Video Not Playing

8.1 Data Displayed with Main Controls

While the video plays, additional information associated with the video can be observed. At the far left of the Main Controls the following information is displayed:

Time: Current time matches where slider is located on the time scale.

Speed: Rate of speed of the playing of the video.

CPU: Display of the percentage of how much of a load the PC or laptop is under while VMS is being used. If CPU usage reaches 90 percent, the percentage display turns red as a warning.

Clicking on the Graph, Map, and Frame Info keys provide data that compliments the video.

8.2 Play, Pause, and Volume controls

The VMS software functions the same operating from a Directory playback source as it does from a Hard disk playback source.

From within Video Segment, double-click on the section of video to begin playing it.
The vehicle icon can also be selected with a single click and video for it can be played by clicking 'Play' from the Main Controls. To stop the video, click the 'Pause' key. The volume can be adjusted by selecting the 'Volume' key. A slider bar allows the volume to be increased or decreased. Slide the bar to the left to decrease the volume and slide the bar to the right to increase volume.

Play Key

Pause Key

Volume Key

Volume Control Bar

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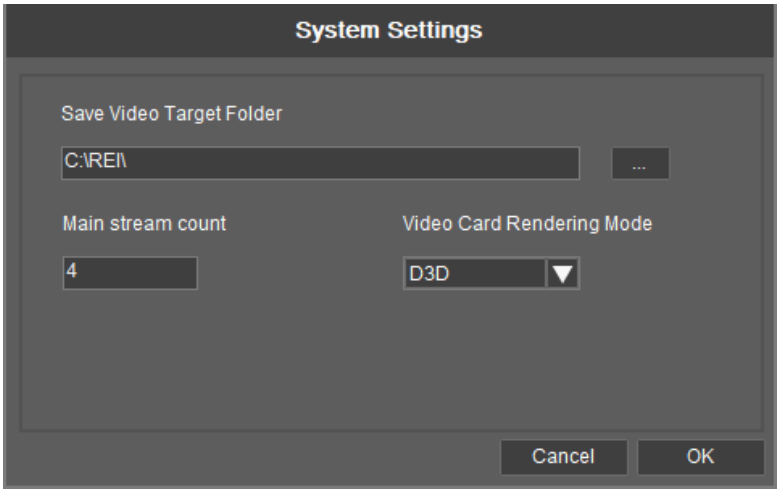
8.3 System Settings Key

Click on the Settings key to display the default settings for the target folder where the video is saved (i.e. C:\REI\). These settings are recommended to remain at its default values. The Main Stream Count indicates the number of channels that are applied at lower-quality sub-stream before switching to higher-quality mainstream viewing mode. If there are four of fewer video channels, the viewing mode switches to mainstream. If there are more than four channels, the viewing mode switches to sub-stream mode.

Settings Key: Select this key to view/change the main stream count, set the video card rendering mode, and the video target folder**.** This setting is made to determine the location where the saved video can be accessed.



System Settings window

In the event where video is sluggish, flashes, or leaves artifacts when changing window configurations, change the Video Card Rendering Mode. Try each of the three settings (D3D, DDRAW, or GDI) until the best resolution is found.

Once the settings are made, click OK to save the settings.

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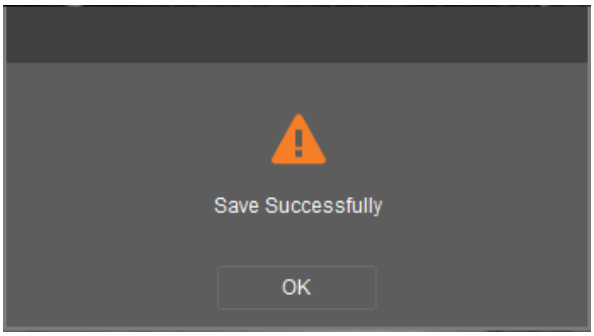
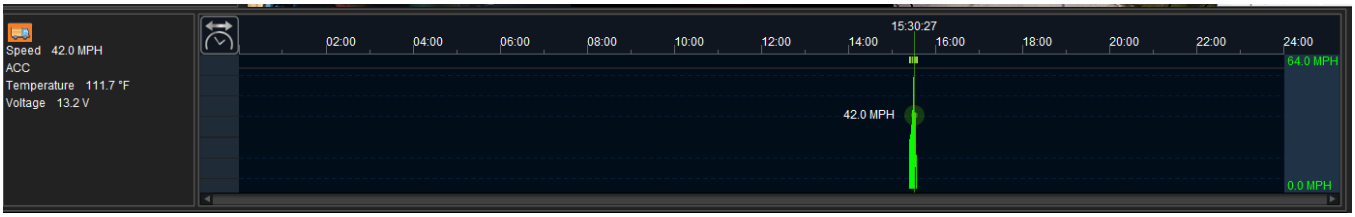


System Settings saved

8.4 Graph Key

Clicking on the Graph key provides a graph displaying vehicle speed, accelerometer readings, system voltage, and the operating temperature of the DVR at the time the video was recorded. Output of each category can be displayed by choosing a category from the menu on the left side of the graph.

Graph Key selected



Graph output display

The green bar of the graph coincides with the data displayed on the left menu of the graph compiled at the time when the video was recorded.

Speed

Click on Speed on the graph menu and the speed of the vehicle at the time of recording is depicted on the graph in miles-per-hour.

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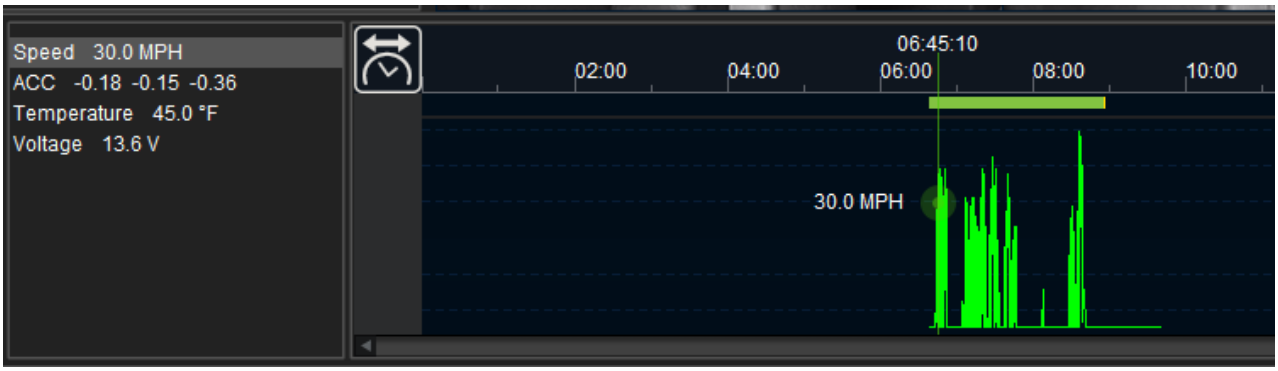

Graph depicting vehicle speed

On the far-right side of the graph is the scale.

Range of scale for speed graph

Accelerometer

Click on ACC on the graph menu and the rate of acceleration of the vehicle, at the time of recording, is depicted on the graph in three different units of g-force:

'x' – Forward and backward movement that occurs during acceleration as well as de-acceleration. A positive number denotes a measure of forward movement while a negative figure indicates a backward movement.

'y' – Measurement of how much a left or right turn is felt. A positive number denotes a left turn and a negative figure a right turn.

'z' – How much up and down motion is realized when the bus travels over a bump. A positive number measures movement up and a negative figure denotes movement downward.

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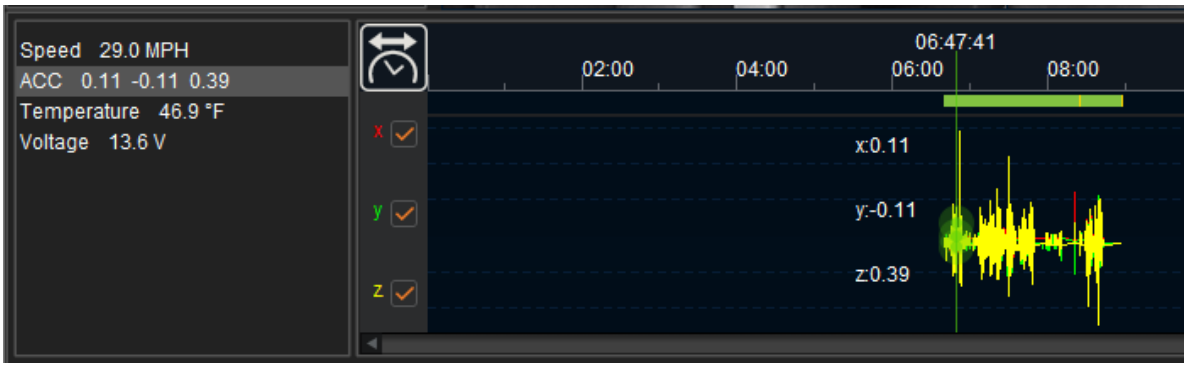
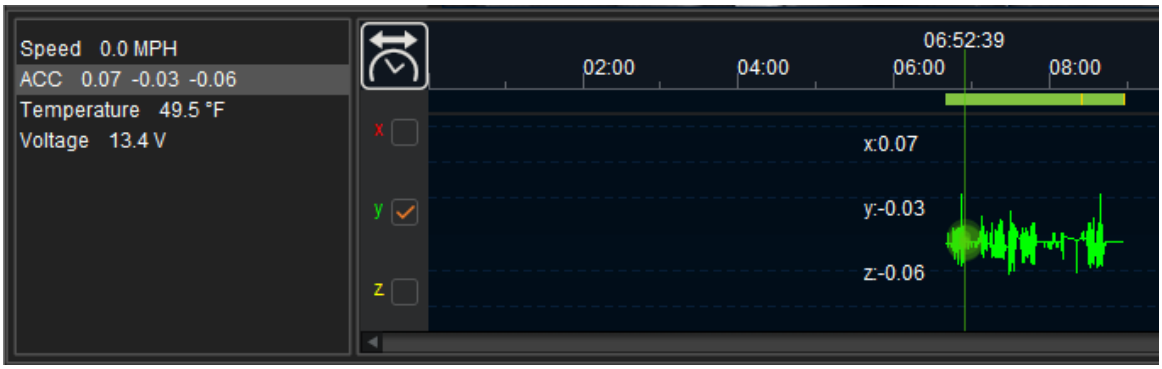


Graph depicting rate of acceleration

By default, all three accelerometer measurements are selected. Each unit of measure can be unchecked to allow any number of these measurements to be illustrated on the graph. In the following example, the graph only depicts left/right accelerometer data because the other checkboxes are not selected.



Graph depicting single accelerometer reading

On the far-right side of the graph is the scale.

.

Range of scale for acceleration

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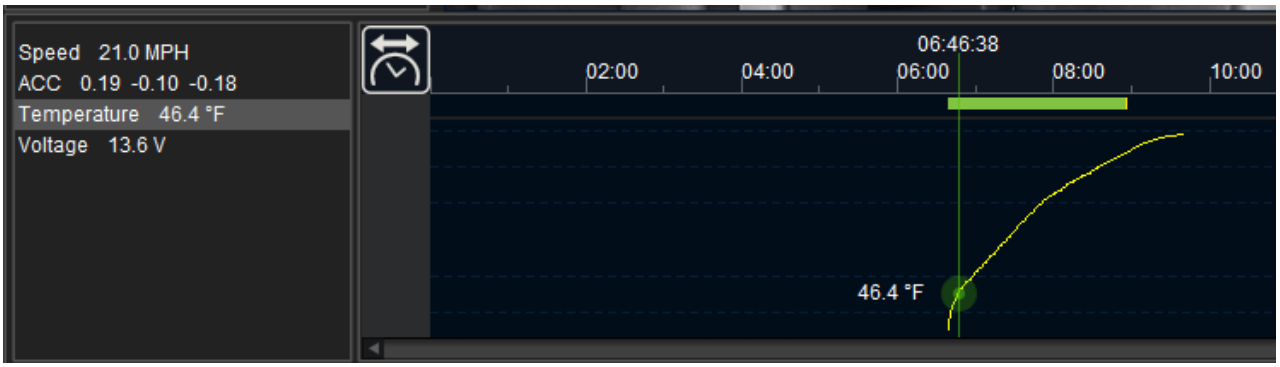
Temperature

Click on Temperature on the graph menu and the temperature of the DVR on board the vehicle, at the time of recording, is depicted on the graph in degrees Fahrenheit.



Graph depicting DVR temperature

On the far-right side of the graph is the scale.

Range of scale for DVR temperature

Voltage

Click on Voltage on the graph menu and the system voltage, at the time of recording, is depicted on the graph.

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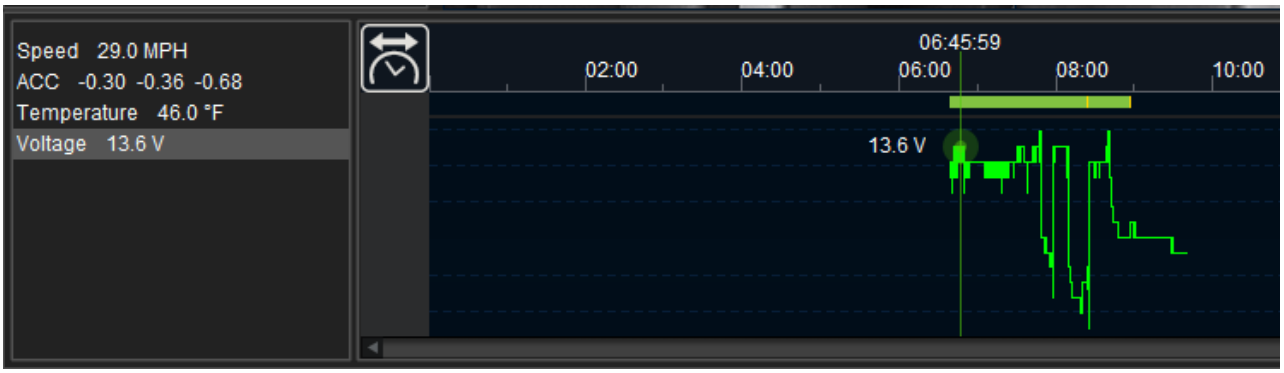

Graph depicting system voltage

On the far-right side of the graph is the scale.

Range of scale for system voltage

Click the Graph key to close.

8.5 Map Key

Clicking on the Map key opens a GPS view showing the route and location of the bus (i.e. Chief-K145) as it covers the trip on its designated route. The blue lines on the map indicate the untraveled portion of the trip. The red lines indicate the portion of the trip already traveled.

Map Key selected

From the upper left corner of the map, users can select a map or satellite view by clicking on one of the Map/Satellite boxes. When hovering over the Satellite box, a 'Labels' checkbox appears. Clicking this checkbox allows street names and other map details to either be displayed or hidden. By default, the 'Labels' checkbox is checked.

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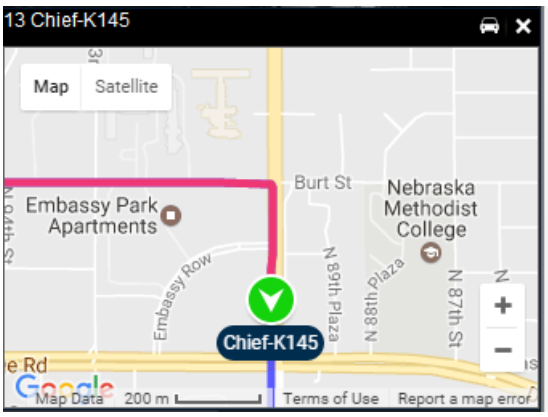
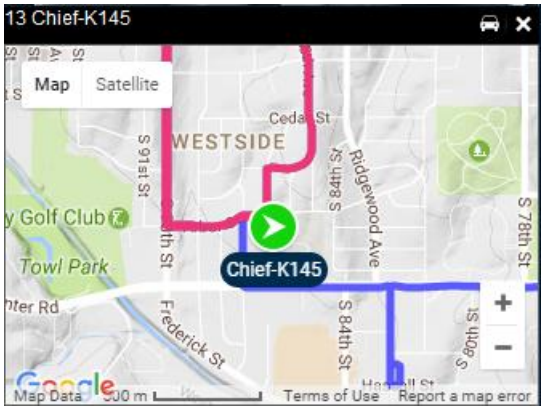
When hovering over the Map box a ‘Terrain’ checkbox appears. Clicking this checkbox allows topographical details to appear while leaving the checkbox clear minimizes the details. By default, the ‘Terrain’ checkbox is clear.



Map View



Map View Terrain checked

Satellite View

Satellite View Labels unchecked

A vehicle icon in the upper right corner of the map indicates ‘Keep the vehicle in view’ is active and the vehicle arrow remains on the map as it travels along its GPS route. Clicking on the vehicle icon does not ‘Keep the vehicle in view’ as it travels along its GPS route.

‘Keep Vehicle in View’ enabled

‘Keep Vehicle in View’ not enabled

The map view can be zoomed in and out using the zoom buttons in the lower right corner of the map.

Zoom view in and out

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It is possible to navigate within the map by clicking and dragging the hand icon on the map.

Click the Map key or the '**X'** in the upper right corner of the map to close.

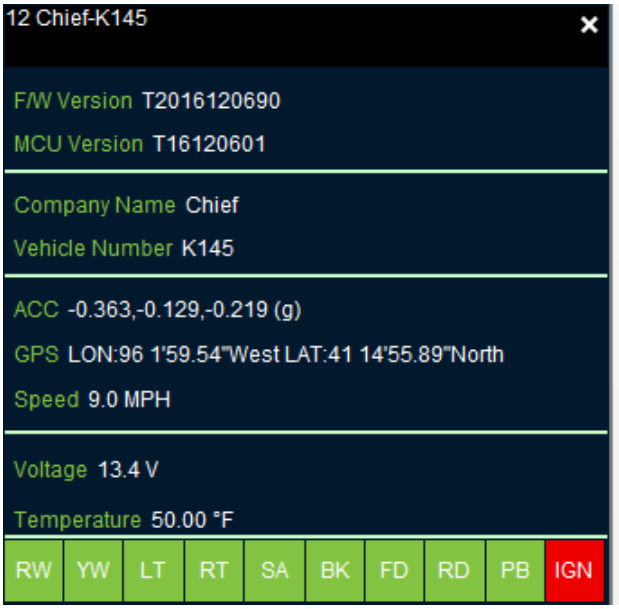
8.6 Frame Info Key

When selected, system values and status of all inputs are emphasized while video is playing. On the Frame Info table, the following system data is displayed:

- F/W Version – Firmware Version currently installed on the mobile device
- MCU Version – Micro Controller Unit version currently installed on the mobile device
- Company Name – Bus company
- Vehicle Number – Number of the bus subject of the video
- Vehicle acceleration rate (ACC) – 'X'/'Y'/'Z' accelerometer measurements
- GPS location – Where the bus is located on its route
- Speed – How fast the bus is moving
- Voltage – System voltage
- Temperature – Operating temperature of the DVR unit

Frame Info Key selected

When the Frame Info key is clicked, the following data table appears.



The row of indicators at the bottom of the Frame Info window represent the following info events:

- RW – Red Warning light on
- YW – Yellow Warning light on

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- LT – Left Turn signal on
- RT – Right Turn signal on
- SA – Stop Arm out
- BK – Brakes applied
- FD – Front Door opened
- RD – Rear Door opened
- PB – Panic Button applied
- IGN – Ignition On, vehicle running

The color of the indicators has meaning. If the indicator is green, there is no activity involving that event. If the indicator is red there is activity involving that event. Vehicle event details are dependent on what inputs have been selected for the vehicle. The events that appear at the bottom of the Frame Info window are determined at the time the DVR was installed in the vehicle.

8.7 Keys used to control the speed and playing direction of video

The other keys on the Main Controller are used to rewind, fast forward, slow forward/backward video. It is also possible to move from frame to frame within the video. The following keys allow the manipulation of the video display:

Previous Frame: Click the Pause key and click the Previous Frame key once to go back one frame.

Fast Forward: Enables the user to advance the video further to view a specified portion of the video. Click the Fast Forward key to play forward at 2x the speed. A second click increase the speed 4x, a third click 8x, a fourth click 16x and a fifth click 32x. The rate of forwarding doubles with each click. Click Pause and click Play to restore normal playing speed.

Fast Rewind: One click to reverse video play backward at 2x the speed. A second click 4x, third click 8x, fourth click 16x, and a fifth click 32x. The rate of rewind doubles with each click. Click Play to restore normal playing speed.

Rewind: Key selected to turn back the video to repeat play of a specified portion of the video.

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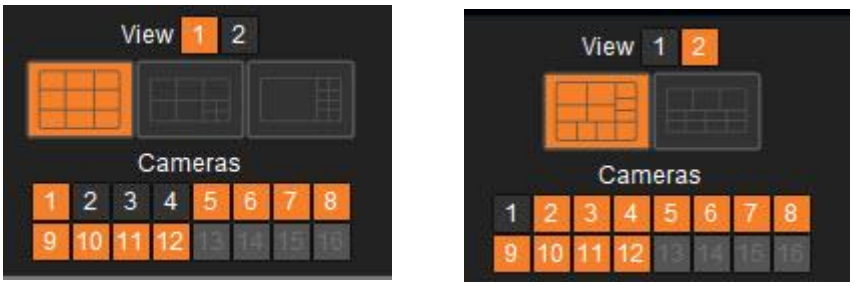
Slow Forward: Click to reduce speed with each increment back from any rate of speed clicked. For example, 4x is reduced to 2x with one click. Click again to reduce 2x to 1x and so on. Slow speed can be reduced under 1x down to a rate of 1/32x speed.

9 Layout and Cameras

While viewing video, the display of the video can be changed by increasing or decreasing the number of camera angles and/or place a higher emphasis on a specified view.



Layout and Camera views

Layout: The arrangement of the video display windows. The layout can be set to View 1 or View 2.

Cameras: Indicates the number of camera channels used to view the video and identifies the window that displays each camera view. The corresponding layout options for the 12 cameras is also 12 for a total of 24 between View 1 and View 2.

10 Channel header detail

Each video channel has header that displays the identification of the bus (i.e. Chief-K145), the channel number, and the video streaming data (i.e. CIF- 30 FPS). In addition to this information, in the upper right corner of the channel header, is four function options used to manipulate the video on the channel. Click '**X**' to close the channel.

Video Channel header

10.1 Zoom

Zoom: Click the Zoom icon to zoom-in on a specific subject in the video. After clicking the zoom icon, a '**+**' symbol appears and by clicking and dragging the symbol, it is possible to highlight an area of the video for a close-up view.

To exit Zoom, click the Zoom icon.

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10.2 Snapshot

Snapshot: Click the Snapshot icon to open a photo of a selected channel of the video. The photo is opened to Picture Viewer. From within Picture Viewer, the snapshot is identified by Device ID (Vehicle and channel number). Details from the time when the snapshot was taken is also listed below the image. Information such as the location of the bus measured in longitude and latitude and following Frame Info data (vehicle speed, DVR temperature, system voltage, and accelerometer readings) are listed below the image.

Snapshot

The brightness and saturation of the Picture Settings can be changed. Also, within Picture Viewer the snapshot can be zoomed in and out, printed, saved, e-mailed, blurred, and text can be added below the listing of the snapshot details. Click and drag and crop/lasso functionality is also available.

10.3 Blur

Blur: Allows a selected image to be blurred to where the image cannot be identified. Clicking the blur icon opens a dialog box that offers the option of selecting a Simple or Advanced blur.

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Simple Blur

Choosing Simple Blur provides the option to use Add Blur Rectangle. Upon clicking on 'Add Blur Rectangle' a Blur Settings window opens with the image of the selected channel displayed.

Blur Settings window

At the bottom right corner of the Blur Settings window is a tool bar that allows the manipulation of the image to be Deleted, OK (saved), or canceled. The 'Undo' arrow can be clicked repeatedly to undo each change individually.

|Undo| *|Delete|* *|OK|* *|Cancel|*

To create a simple blur, click on the Blur icon in the selected channel header that opens a dialog box. Within the dialog box keep the default setting 'Simple' selected and click on the 'Add Blur Rectangle' key to open the Blur Settings window. From within the image on the blur settings window, click and draw around the image to apply the rectangle that will encompass the blur. If the rectangle is not in an acceptable position, click the 'Delete' trash can icon on the toll bar to clear the blur and re-apply the rectangle. If the blurred image is acceptable, click the 'OK' green check icon to apply the blur to the image.

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Simple Blur applied

To erase a blur, click the blur icon in the channel header and click ‘Clear All.’

To create an inverse blur, which blurs everything surrounding the rectangle on the image, click on the Blur icon on the selected channel header. With the default ‘Simple’ option remaining selected, click the ‘Inverse Blur’ check box. Then click ‘Add Blur Rectangle.’ Within the Blur Settings window select the area that is not to be blurred. After clicking the ‘Ok’ green check box, the area surrounding the portion of the image that was highlighted (the passengers in the following sample) will be blurred.

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Inverse Blur

The slider bar, ranging from 1-20, controls the intensity of the blurring effect. Click and drag the slider bar to a higher number further to the right on the scale to increase the intensity of the blur. Clicking and dragging the bar to a lower number to the left of the scale decreases the intensity of the blur.

10.4 Advanced Blur

Use Advance Blur to control when the applied blur appears during the video. A time scale on the Blur Editor window allows a blur to be applied during specific segments and for a specified duration of the video. This time scale functions the same as the time scale on the main VMS window.

Click on the Blur icon in the selected channel header that opens the Blur dialog box. Within the dialog box select 'Advanced' and click on the 'Modify Blurs' key to open the Blur Editor window. From within the image on the Blur Editor window, click the 'Add Blur' key in the lower left corner of the Blur Editor window that opens a Blur Settings window. From Blur Settings, click and draw around the image to apply the rectangle that will encompass the blur. Click the 'Delete Blur' key to clear the blur.

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Blur Editor

Blur settings are created in Advanced Blur mode the same way blur settings are made in Simple mode. As the blurs are being created, they are identified on the time scale grid. The colors of the bars on the scale indicate segments of video. Green bars indicate video segments that do not contain any blurred footage. The white bars represent a blurred video segment. A blue bar represents a blurred video segment that has been or is being displayed.

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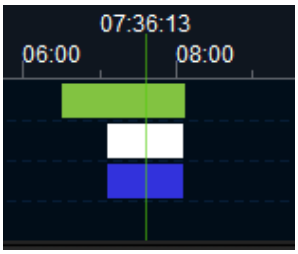
Adding blur using Advanced Blur Editor



Blur Editor Time scale

The time when the blur appears in the video and the duration of the blurred video segment can be adjusted on the time scale. While hovering over the blue video segment bar an arrow pointing left and right appears. The arrow can be clicked and dragged to expand the bar to expand the duration of the blurred segment or clicked and dragged to contract the bar diminishing the length the blurred segment appears in the video. If a four-pointed arrow appears while hovering over the bar, the entire bar can be clicked and dragged to a different location on the time scale to make the blur apply to a different portion of the video. If there is more than one blur bar on the scale, the blur bar that is being edited turns from white to blue. Click the 'Save' key to save changes.

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When the time scale bar is dragged over the blurred video segment bar, a depiction of the corresponding blurred image appears in the Blur Editor to indicate where the blur will appear in the video (over the driver in the following sample) and the details of the blurred image can be reviewed.

11 Window Expansion Bar

Click on the arrow bar to change the view to from the initial VMS view displaying the Playback and live View column to a full screen view concealing the Playback and Live View menu.

When the arrow is pointing to the left, the Playback and Live View column is displayed. When the arrow is pointed to the right the column is hidden and the video screen is expanded.

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Click the arrow bar to change the view hiding the Playback and live View column to provide a full screen view.

Full Screen View

Click the arrow bar again to return the view to display the Playback and live View margin from the full screen view.

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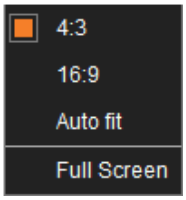
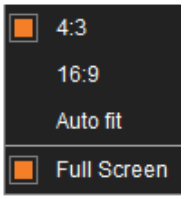
12 Screen Sizing

A right click on the channel screen opens a screen-sizing menu. The default selection is ‘4:3.’ It is also possible to select’16:9’ and ‘Auto fit’ or change to a full screen view. Clicking on ‘Full Screen’ is equivalent to using the arrow bar to display the channels in full view hiding the Playback and live View column. Click ‘Full Screen’ to return to the default view where the Playback and live View column is displayed.





Note: When in full screen mode, the ‘X’ is replaced with the 'Restore Screen' icon that is common in Windows. When clicked this icon will minimize the screen of the window. An alternate method to maximize or restore the window is to double-click on the window. When in multiple channel view, the ‘X’ can still close the channel.

13 Search Settings

The Search settings menu is where the saved video target folders are accessed and where monitored event criteria is configured.

Click on the Search key next to the Video Segment key. Click the gray Search key that appears below to open the Search Settings menu.

The date and time of the subject video appears at the top of the menu. The check boxes allow selection of events to be emphasized for analysis on the video. In the following sample Search Settings window, the panic button event, speed event, and acceleration (ACC) event is checked for analysis. The speed setting is monitored for any occurrence where the bus travels 45 miles-per-hour by typing 45 in the text box next to the ‘Over speed’ check box. The acceleration rate for all three categories (‘X’, ‘Y’, and ‘Z’) is checked and all three are set at 2.0 Gs with that figure entered in the text boxes next to the ‘X’, ‘Y’, and ‘Z’ acceleration categories. Click ‘Search’ at the bottom of the menu.

To revert to not using any Search Settings, uncheck the selections on the menu and click ‘Search’ to clear the selections.

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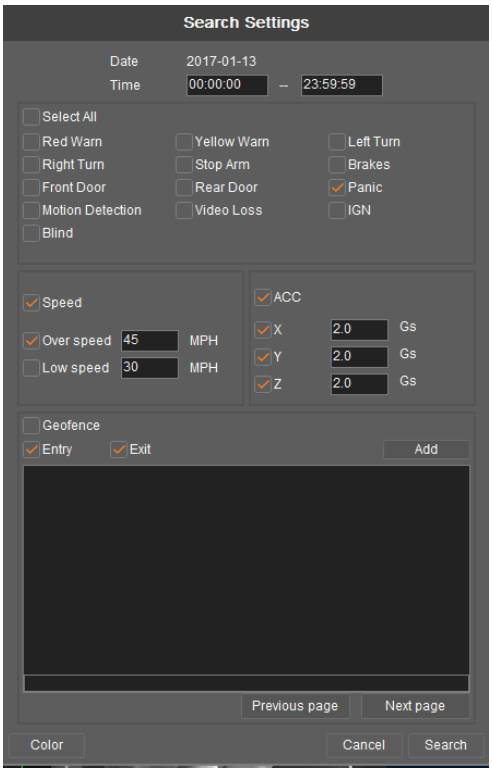
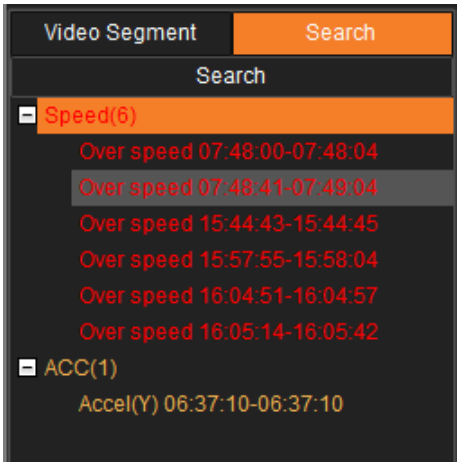


Search Settings menu

After the search completes, the Search column is populated with a listing of video showing all occurrences of the events selected in the Search Settings menu.



Search Settings menu

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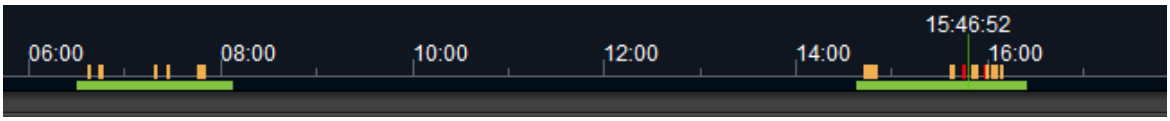
Evaluating the data of the sample search, there was a single acceleration event, with video, where the bus met or exceeded 2.0 Gs of acceleration. There were no instances where the Panic button was depressed. There were six instances, with video, where the bus exceeded a speed of 45 mph.

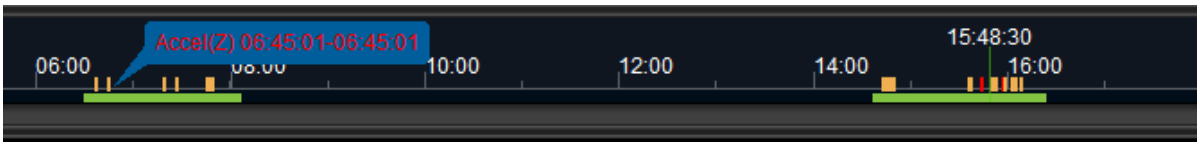
13.1 Search Display on the Time Scale

The available video showing instances of the events found in the search are also displayed on the time scale. The following sample time scale shows each event highlighted on the scale at the time each event was recorded. The marks are color-keyed to match the color that identifies the corresponding event listed on the Search listing.



Time scale identifying searched events

The yellow vertical lines indicate segment of video showing an acceleration event that exceeded 2.0Gs. The red vertical lines indicate a segment of video showing an event where the bus exceeded 45 MPH. Hovering over the vertical lines opens a flag indicating the event and the time of when the event was recorded. In the following sample the cursor is hovering over an event and the flag that opens identifies it as an acceleration event that was recorded at 6:46:01.



Hovering over an event on the time scale

13.2 GPS Map Display

Searched events that occurred on the course of the trip taken on the route are identified with the following status warning icon that appears on the Map.

Status Warning icon

When clicking on the status warning icon denoting an event, a flag appears identifying the event with the date and time when the video was recorded for the event. Clicking on the '**x**' inside the flag closes it.

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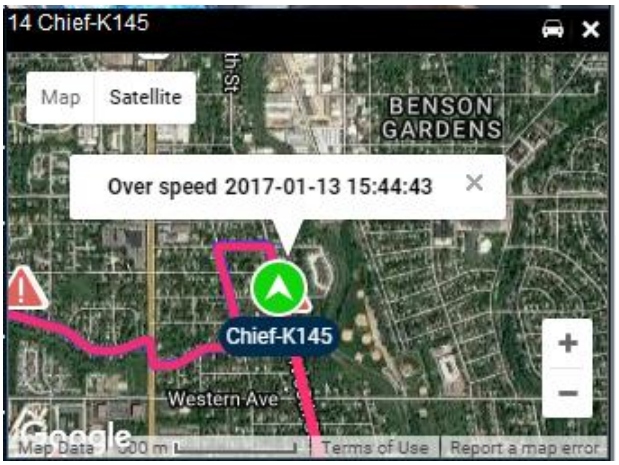
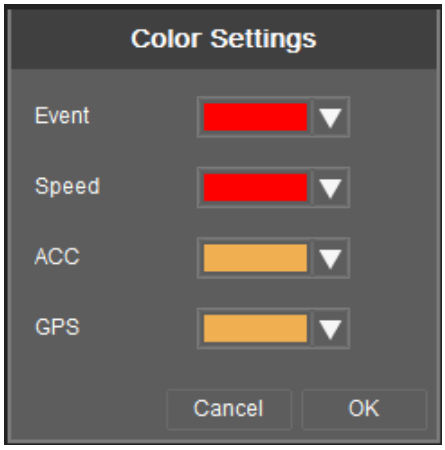


Event flagged on GPS Map



Color Settings menu

Color Settings

At the bottom of the Search Settings menu, a Color key can be selected to open a menu used to designate a color to represent each of the four events selected from the Search Settings menu. Click on the pull down next to each event to open a list of color options that are used to identify each event category from the Search Settings menu. After making the selections, click 'OK,' and click 'Search' on the bottom of the Search Settings menu to complete the updates. Click 'Cancel' to stop the changes.

14 Geofences

A Geofence is used to allow a concentrated area to be monitored from when a bus entered and/or exited the area. For example, if there was a report of a bus hitting a parked car in a specific part of town, a geofence that encompasses that specified area can be reviewed to help determine what bus was involved and confirm the date and time of the reported incident. A geofence can be configured to compile the occurrence of each event, with video showing the date and time, when a bus enters and/or exits a geofence.

Creating a Geofence

From the Search Settings menu, click on the Geofence checkbox. Click 'Add' and a Geofence map opens. From the upper left corner of the map, users can select a map or satellite view by clicking on one of the Map/Satellite boxes. When hovering over the Satellite box, a 'Labels' checkbox appears. Clicking this checkbox allows street names and other map details to either be displayed or hidden. By default, the 'Labels' checkbox is checked.

When hovering over the Map box a 'Terrain' checkbox appears. Clicking this checkbox allows topographical details to appear while leaving the checkbox clear minimizes the details. By default, the 'Terrain' checkbox is clear.

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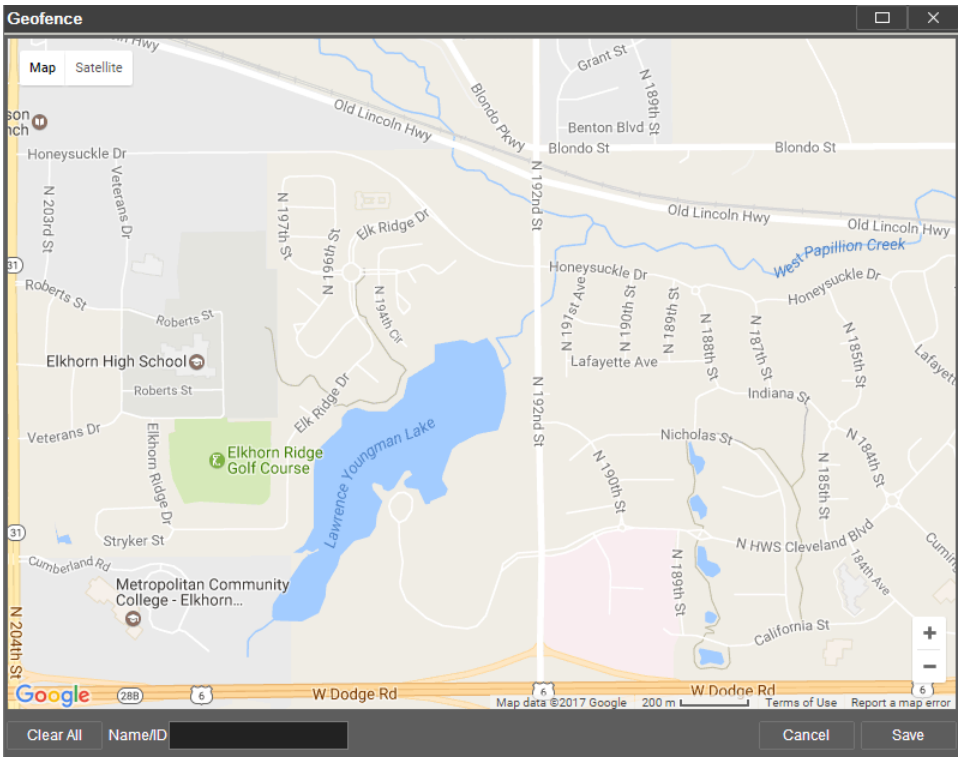
Geofence Map



Initial Geofence Map

The map view can be zoomed in and out using the zoom buttons in the lower right corner of the map.

Zoom view in and out

It is possible to navigate within the map by clicking and dragging the hand icon on the map.

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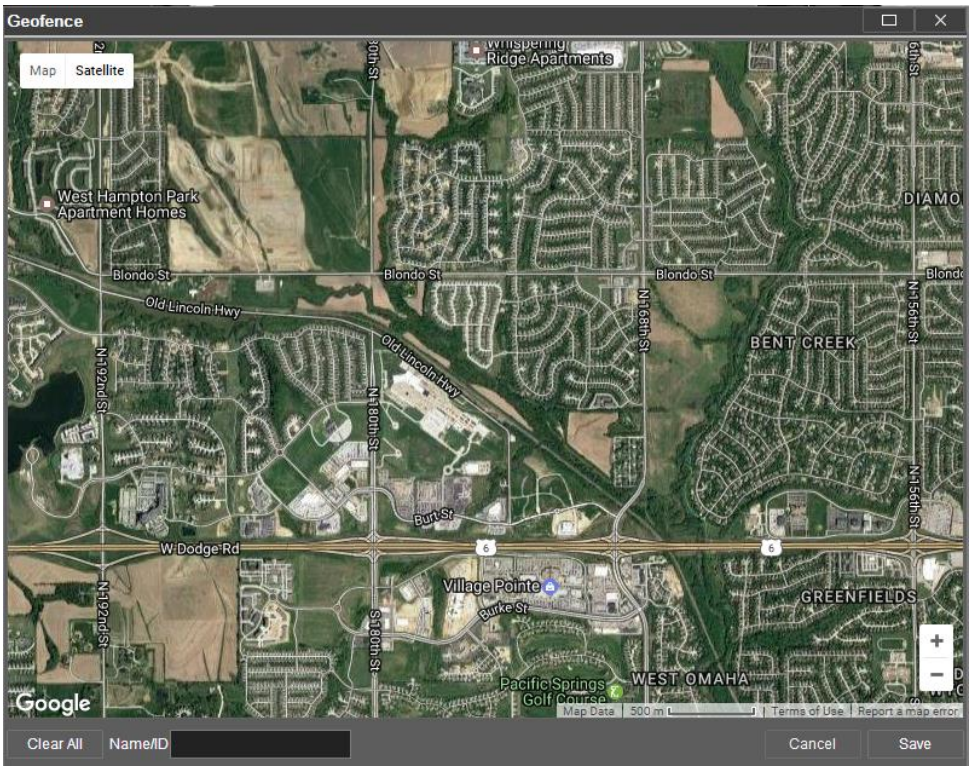

Geofence Map Satellite view

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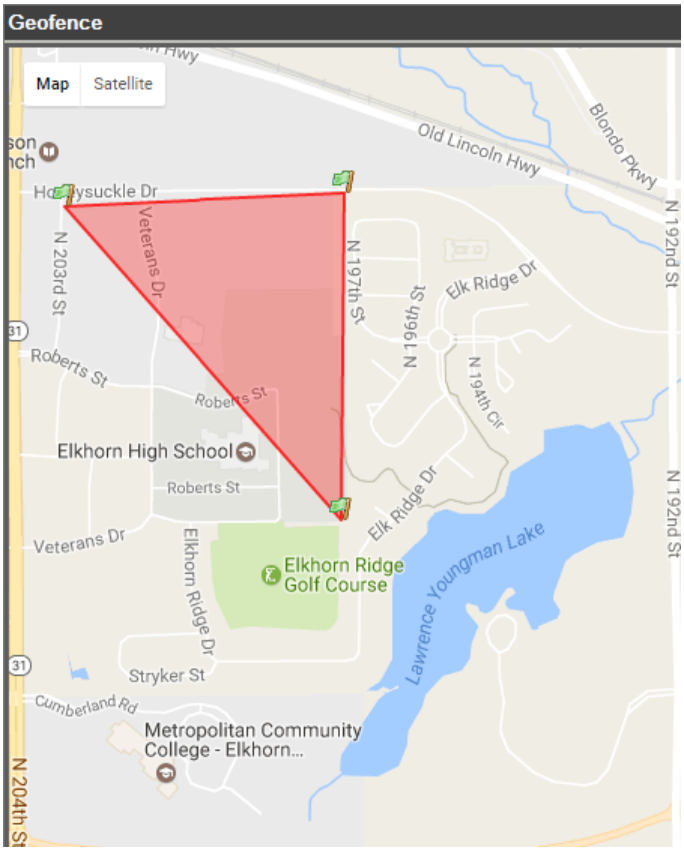
To create a geofence, determine the area on the map that defines the geofence. Click on an area on the map for a starting point of the geofence. Each point is recognized as a small, green, unfurled flag.

: **Geofence point**

Click on another area on the map to connect the two points. Click and drag to adjust the scope of the geofence.

Note: Once a point is created on the map, it cannot be removed. Click 'Clear All' to start over. Clicking 'Cancel' closes the Geofence map entirely.



Plotting Geofence area

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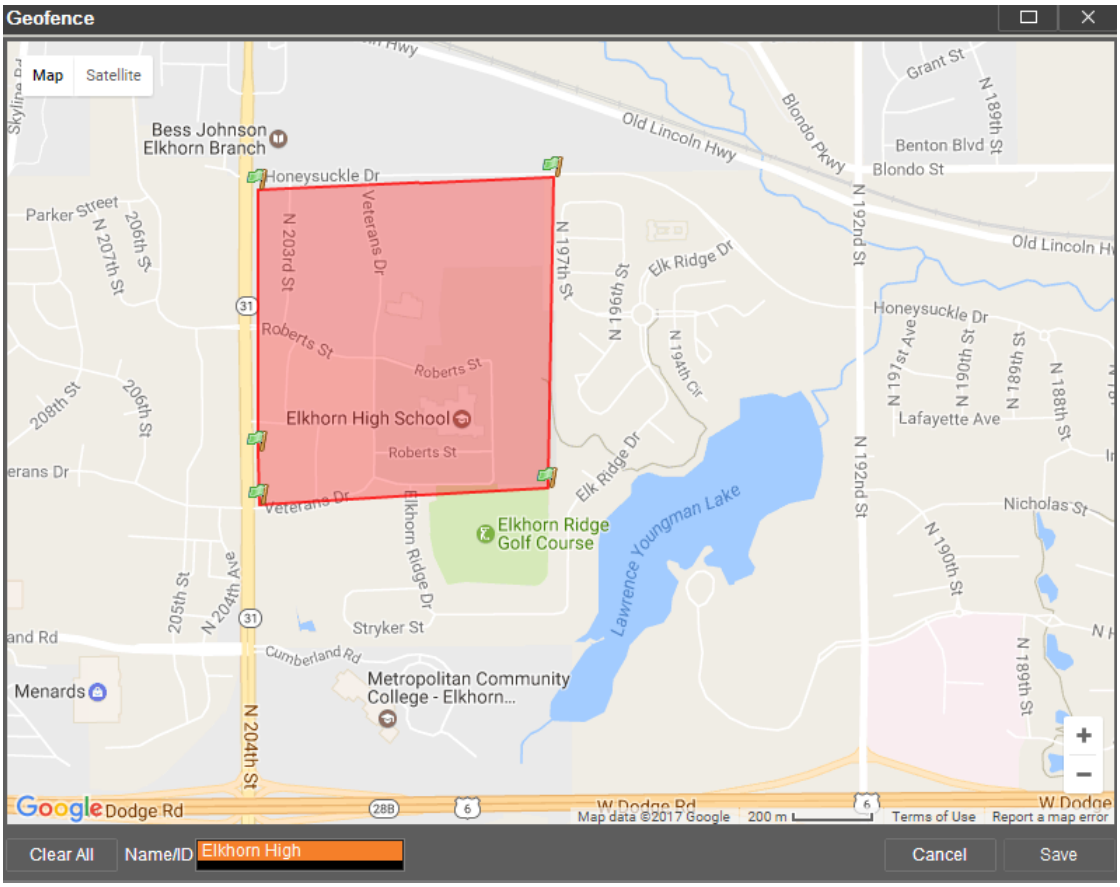
Name the geofence (i.e. Elkhorn High) and click ‘Save.’



New Geofence named

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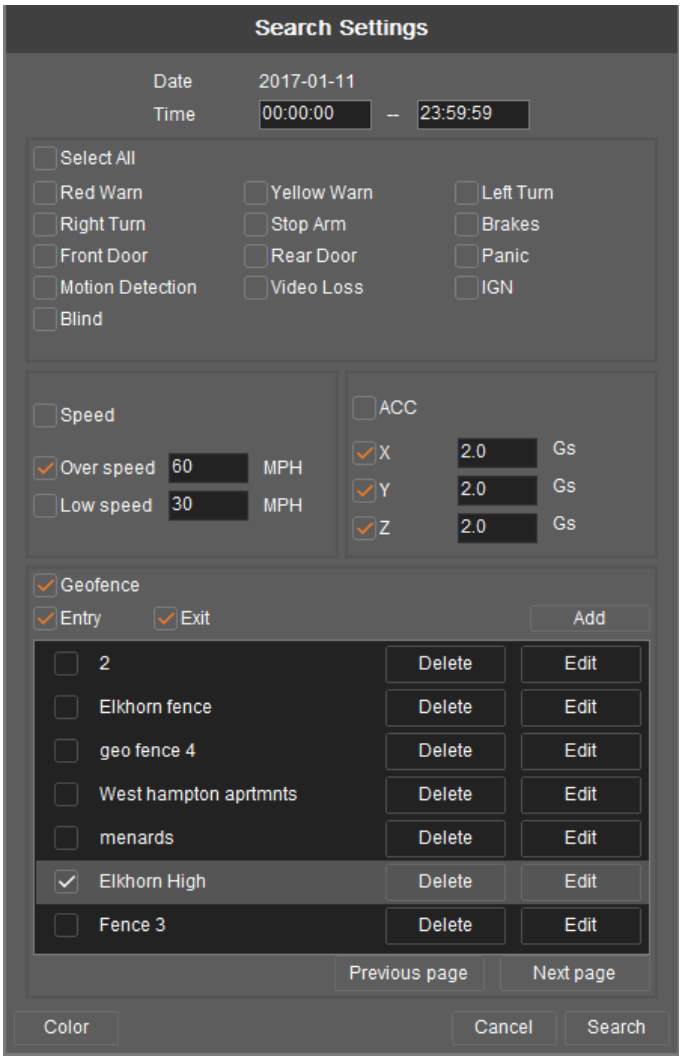
The new geofence (Elkhorn High) is added to the list of saved geofences in the Search Settings menu.



New Geofence added to menu

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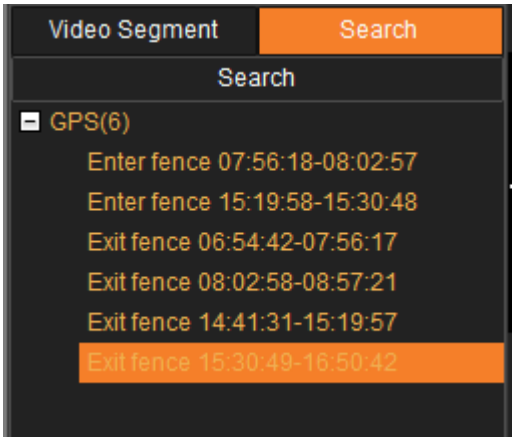
To search for a geofence click on the ‘Geofence’ checkbox. Before selecting a geofence, click the ‘Entry’ or ‘Exit’ checkbox to search for either when the bus enters or exits a geofence, or both. From the list of geofences, click on the geofence to monitor (i.e. Elkhorn High). Then click ‘Search.’

After the search completes, a list of video segments of the ‘Enter fence’ and ‘Exit fence’ events are listed as shown in the following sample. The sample shows six GPS events, with segments of video, where the bus either entered or exited the geofence. Double click the selected video segment to view.



Geofence event search results

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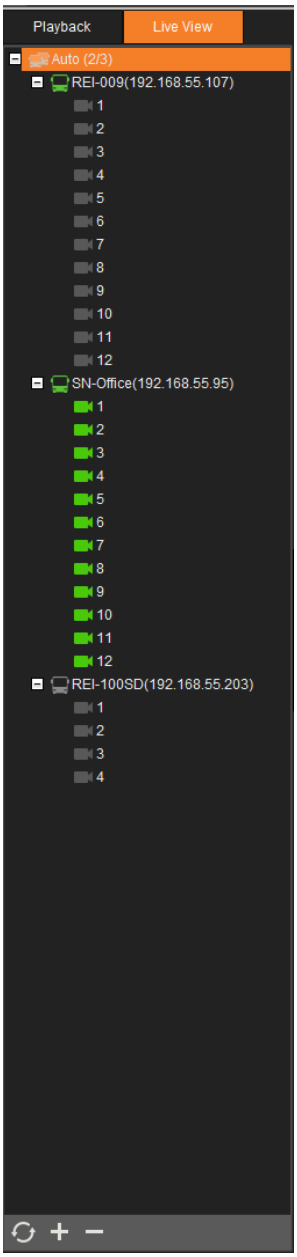
15 Live View

Selecting the Live View Option opens a directory tree with live video available for selection and review. From the directory tree, double-click on the selected vehicle icon to access the video that is available for viewing (i.e. REI-009 (192.168.55.107)).



Live View menu

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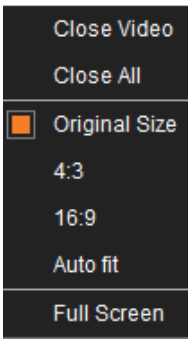
15.1 Live View Video Channel header detail

Each video channel has header that displays the identification of the video source and the I.P. address (i.e. SN-Office (192.168.55.95)), the channel number (i.e. Channel 1), and the video streaming data (i.e. CIF- 30 FPS). In addition to this information, in the upper right corner of the channel header, is the snapshot function icon.

Live View Video Channel header

Live View Screen Sizing

A right click on the channel screen opens a screen-sizing menu. From this menu it is possible to close one or all the playing video. To resume playing the video, double-click on the vehicle icon in the directory pertaining to the video. The default selection is 'Original Size.' Other options are '4:3,' '16:9,' and 'Auto fit.' A full screen view can also be selected. Clicking on 'Full Screen' is equivalent to using the arrow bar to display the channels in full view hiding the Playback and live View column. Click 'Full Screen' to return to the default view where the Playback and live View column is displayed.



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Snapshot: Click the Snapshot icon to open a photo of a selected channel of the video. The photo is opened to Picture Viewer.

Live View Snapshot

The brightness and saturation of the Picture Settings can be changed. Also, within Picture Viewer the snapshot can be zoomed in and out, printed, saved, e-mailed, blurred, and text can be added below the listing of the snapshot details. Click and drag and crop/lasso functionality is also available.

15.2 Live View Tool Bar

The Live View tool bar is similar in appearance and function to the tool bars used with the three Playback options.

Live View Tool Bar

Refresh: Click to restore the Clipping Directory to its previous state.

Add: Enables to select a live video and add a copy of the video to the Auto Directory.

Delete: Clears selected video from the directory.

Note: The function of the tool bar for Live View is interchangeable with the functionality of the Playback Remote (Device) mode tool bar.

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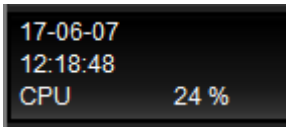
15.3 Main Controls



While video plays, additional information associated with the video can be observed. At the far-left of the Main Controls the following information is displayed:

Video Date: The date of the video in YY-DD-MM format (i.e. 17-06-07).

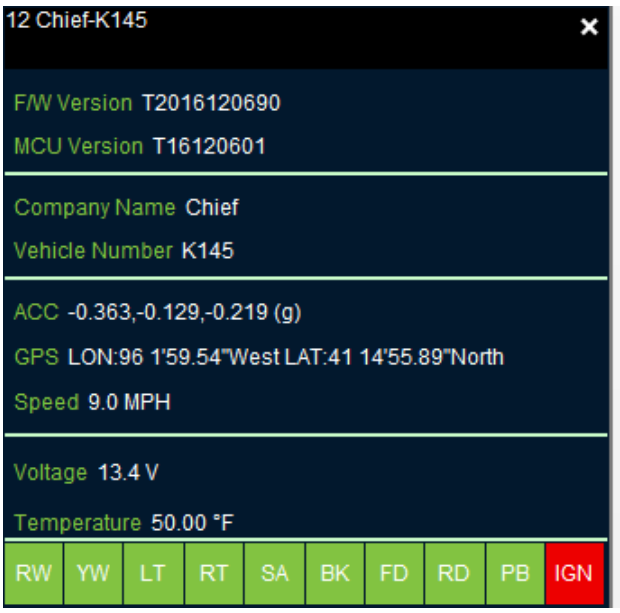
Time: The display of the continual run time of the video in hours/minutes/seconds (i.e. 12:18:48).

CPU: Display of the percentage of how much of a load the PC or laptop is under while VMS is being used. If CPU usage reaches 90 percent, the percentage display turns red as a warning.

Live View Main Control Keys

Frame Info Key selected

When the Frame Info key is clicked, the following data table appears.



Live View Frame Info

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The row of indicators at the bottom of the Frame Info window represent the following info events:

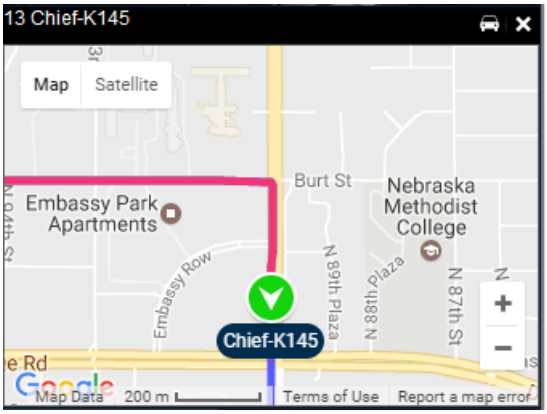
- RW – Red Warning light on
- YW – Yellow Warning light on
- LT – Left Turn signal on
- RT – Right Turn signal on
- SA – Stop Arm out
- BK – Brakes applied
- FD – Front Door opened
- RD – Rear Door opened
- PB – Panic Button applied
- IGN – Ignition On, vehicle running

The color of the indicators has meaning. If the indicator is green, there is no activity involving that event. If the indicator is red there is activity involving that event. Vehicle event details are dependent on what inputs have been selected for the vehicle. The events that appear at the bottom of the Frame Info window are determined at the time the DVR was installed in the vehicle.

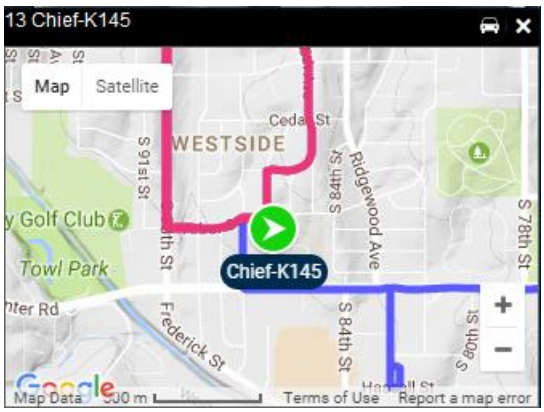
Map Key selected

From the upper left corner of the map, users can select a map or satellite view by clicking on one of the Map/Satellite boxes. When hovering over the Satellite box, a 'Labels' checkbox appears. Clicking this checkbox allows street names and other map details to either be displayed or hidden. By default, the 'Labels' checkbox is checked.

When hovering over the Map box a 'Terrain' checkbox appears. Clicking this checkbox allows topographical details to appear while leaving the checkbox clear minimizes the details. By default, the 'Terrain' checkbox is clear.



Map View



Map View Terrain checked

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Satellite View

Satellite View Labels unchecked

A vehicle icon in the upper right corner of the map indicates 'Keep the vehicle in view' is active and the vehicle arrow remains on the map as it travels along its GPS route. Clicking on the vehicle icon does not 'Keep the vehicle in view' as it travels along its GPS route.

'Keep Vehicle in View' enabled

'Keep Vehicle in View' not enabled

The map view can be zoomed in and out using the zoom buttons in the lower right corner of the map.

Zoom view in and out

It is possible to navigate within the map by clicking and dragging the hand icon on the map.

Layout Key

Use this key to alter how the video is displayed based on the number and size combinations of video display channels. A total of 14 display combinations are offered with a maximum number of 18 channels displayed.

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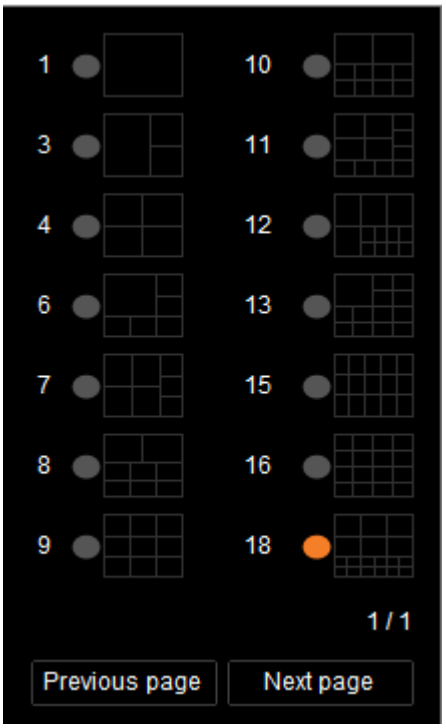

Layout menu

Previous page/Next page: Click to navigate to from each channel grouping based upon the layout selected.

System Settings

Click on the Settings key to display the default settings for the target folder where the video is saved (i.e. C:\REI\). These settings are recommended to remain at its default values. The Main Stream Count indicates the number of channels that are applied at lower-quality sub-stream before switching to higher-quality mainstream viewing mode. If there are four of fewer video channels, the viewing mode switches to mainstream. If there are more than four channels, the viewing mode switches to sub-stream mode.

Settings Key: Select this key to view/change the main stream count set the video card rendering mode, and the video target folder**.** This setting is made to determine the location where the saved video can be accessed.

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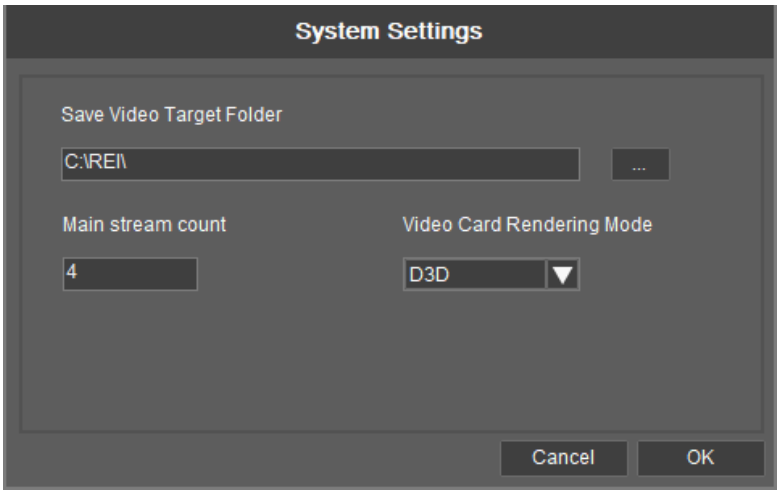

Live View System Settings window

In the event where video is sluggish, flashes, or leaves artifacts when changing window configurations, change the Video Card Rendering Mode. Try each of the three settings (D3D, DDRAW, or GDI) until the best resolution is found.

Once the settings are made, click OK to save the settings.

Sound Key: The volume can be adjusted by selecting the 'Volume' key. A volume control bar allows the volume to be increased or decreased. Click and drag the bar to the left to decrease the volume and drag the bar to the right to increase volume.

Volume control bar

Only I Frame: Click this key to slow down the video playing speed for a video snap shot of an Index frame that comes in once per second. When the key is clicked all channels are applied with this function.

Click the key again to turn off the functionality to revert to normal video playing speed.

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16 Technical Support

If at any time you run into issues with any aspect of REI Software Suite, or with the DVRs, feel free to contact REI's world-class team of technical support specialists. They are available 24/7 to assist you.

Service Hotline: 1-877-726-4617 (Toll Free).

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