MobileView

PENTA Installation Manual

UM-TR-1210

PENTA Installation Manual

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

You are cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

http://www.mobileviewvideo.com
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Phone: 1.844.899.7366
Email: service@seon.com

Content

Chapter 1
Introduction

Summary

This chapter provides an overview of MobileView PENTA, including minimum hardware and software requirements, and the steps you need to perform before installing, configuring, and using MobileView PENTA.

Content

About this manual

The *MobileView PENTA Installation Manual* includes an overview of the product and detailed instructions explaining:

- How to wire the MobileView system
- How to configure and commission the system
- How to test the system

There is also information describing how to contact technical support if you have questions or concerns. To use this document effectively, you should have a basic knowledge of the following:

- CCTV systems and components
- Electrical wiring
- Windows XP operating system
- TCP/IP networking
- Windows Remote Desktop protocol and file sharing

Read these instructions and all related documentation before installing or operating this product. The most current versions of this and related documentation are available from technical support. Refer to “Contacting us” on page 89 for instructions on contacting technical support.

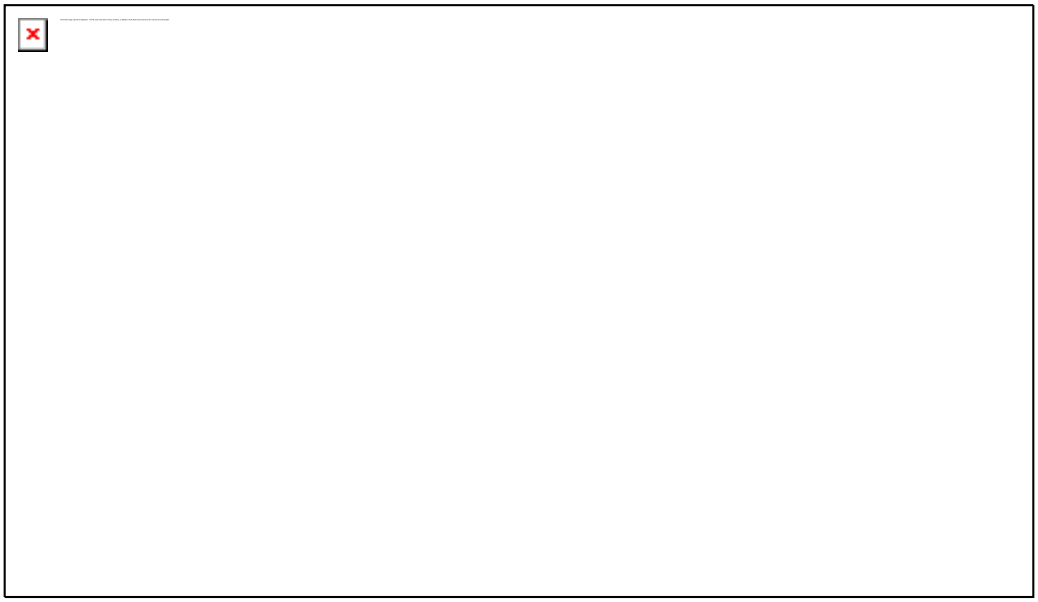
Note: A qualified service person, complying with all applicable codes, should perform all required hardware installation.

Product overview

The MobileView PENTA digital video recording system (DVR) has two models that support up to sixteen cameras, multichannel audio, and optional equipment such as an impact sensor, status/tag indicator, GPS, and wireless networking devices.

A MobileView system consists of software applications and the required equipment. The system may also include the accessories shown in Figure 1 on page 3.

Figure 1: Typical MobileView PENTA system layout



1. Aluminum housing
2. Camera
3. Up to 16 cameras per DVR
4. RG179 Siamese coaxial cable
5. GPS antenna
6. DVR assembly
7. Wireless bridge
8. Wireless antenna
9. Wireless antenna cable
10. Microphones
11. Ethernet cable
12. Panic button
13. Accelerometer
14. Impact sensor

The central component of the MobileView system is a high-quality DVR, which records images from eight or sixteen cameras (monochrome or color) depending on model, dual-channel audio and other information such as the time, date, and vehicle number. You can adjust image storage capacity by changing your recording speed, selected resolution, and drive size.

The DVR begins capturing video within 90 seconds of receiving the vehicle's ignition signal. It continues to capture data while that signal is present and for a programmable shutdown delay period after the vehicle ignition signal expires. Surveillance and event-based video data is stored on a mobile-rated, removable hard disk drive caddy. When available storage capacity is full, the DVR automatically overwrites the oldest data with new data in a FIFO (first-in, first-out) fashion.

Note: Most MobileView products are not supplied with mounting hardware. Exceptions are noted in the appropriate sections of the manual.

The MobileView solution uses Video Manager software for the review of surveillance and event-based video stored on the DVR. Video Manager is also

used to configure MobileView operating parameters. The Fleet Manager application adds remote management tools to automate video download, device health checking, e-mail notifications, and more.

Retrieving and viewing images

The DVR stores the captured digital images as monochrome or color files, which you can download to a computer using the MobileView Video Manager software. The DVR connects to a viewing station through a wired or wireless Ethernet connection. The viewing station is generally a laptop or desktop PC running the Windows XP (or Vista) Professional operating system. When you are connected to the viewing station, you can view or observe live video and log data stored on the DVR. You can also transfer recorded data to long-term storage media such as DAT tapes or recordable CDs.

Note: An Ethernet crossover cable is required to connect the DVR to the viewing station via a wired Ethernet connection.

Product contents

The *MobileView PENTA* system consists of a digital video recorder (DVR) assembly that includes:

- DVR main assembly
- Removable HDD caddy and key
- Removable wiring backbox
- Mounting plate

A MobileView system can contain one or more of these accessories:

- Camera (16 maximum)
- Panic button
- Impact sensor
- Microphones
- Accelerometer
- GPS antenna
- Wireless bridge
- LCD display monitor

Inspect the package and contents for visible damage. If any components are damaged or missing, do not use the unit. Contact the supplier immediately. If you need to return the unit, you must ship it in the original box.

System requirements

You need a PC to view the images and to interact with the system. The minimum PC requirements are:

- Windows XP OS with SP2 and all current updates (or Vista)
- .NET Framework SP1.1 and 2.0
- Intel Core 2 dual 2.4 GHz
- Intel 945 chipset recommended
- 2 GB recommended
- SVGA monitor (1024 x 768 pixel resolution)
- NVIDIA 8XXX series GPU, 9XXX series recommended
- 160 GB hard disk space (360 GB recommended)
- DVD-RW drive
- Ethernet crossover cable

Other requirements

Make sure you have access to the tools you will need to complete the installation:

- BNC crimper
- Cat 5 Ethernet crossover cable
- Cat 5 Ethernet patch cable
- Drill and bits, up to 5/8 in.
- Electrical connections (ends, lugs,etc.)
- Electrical tape
- Electrical voltmeter
- Extension cords
- General tools
- Heat shrink
- Hole saws, up to 1–1/8 in.
- Laptop/viewing station
- Thread-locking compound
- Molex pin crimper
- Phillips and flathead screwdrivers
- Riv-nut gun
- Socket set, up to 5/8 in.
- Solder gun with solder
- Spare BNCs
- Wrenches, up to 5/8 in.
- Spare Molex pins
- Spare terminal blocks
- Tie wraps (8 in.)
- Torx bit, secured #10
- Wire snake
- Wire strippers

References and related documents

For information related to *MobileView PENTA* and its operation, consult the following documents:

- *MobileView Fleet Manager User Manual* (P/N 1056730)
- *MobileView Video Manager User Manual* (P/N 1056729)
- *MobileView Sideye Camera Installation Instructions* (P/N 1032731)
- *MSS-7007-00-FF Camera Installation Instructions* (P/N 1038137)

You may also want to see the documentation for your cameras and other products for installation and setup information.

Chapter 2
Camera installation

Summary

This chapter provides information on determining a system layout and installing the hardware components.

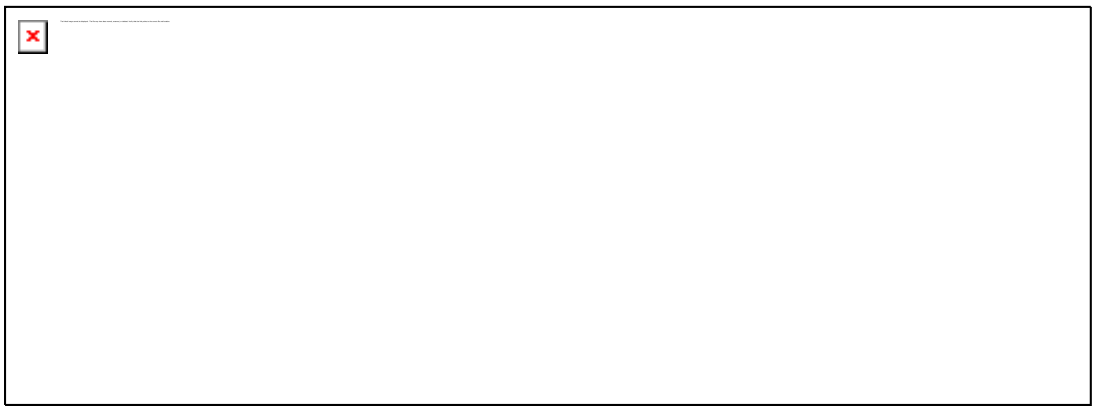
Content

System layout

Camera layout and fields of view vary based on several factors including vehicle seating arrangements, partition walls, door location, and customer guidelines. It is the responsibility of the installer to ensure that these factors are adequately considered before installation begins.

Figure 2 below shows a typical, eight-camera layout generally used on a 40’ transit bus. While most areas of the vehicle are covered when cameras are located in this manner, this illustration is provided as a guide and not a rule for actual camera placement. In all new installations, you should obtain customer acceptance of camera location and fields of view as part of installation planning.

Figure 2: Typical eight-camera setup with fields of view shown



1. Front door camera. Front of the bus over the driver’s head, looking at the front passenger entry.
2. Forward-facing camera. Front of the bus, looking in front of the bus.
3. Front-to-rear camera. Front of the bus, looking down the center aisle to the back.
4. Rear exit camera. Across from the back door, looking at the back doorway.
5. Rear-to-front camera. Back of the bus, looking up the aisle to the front of the bus.
6. SideEye side camera. Exterior of the bus by the front door, looking toward the back of the bus.
7. Center-to-rear camera. Between the front and back door, looking down the center aisle to the back of the bus.
8. SideEye rear camera. Back of the bus, looking behind the bus.

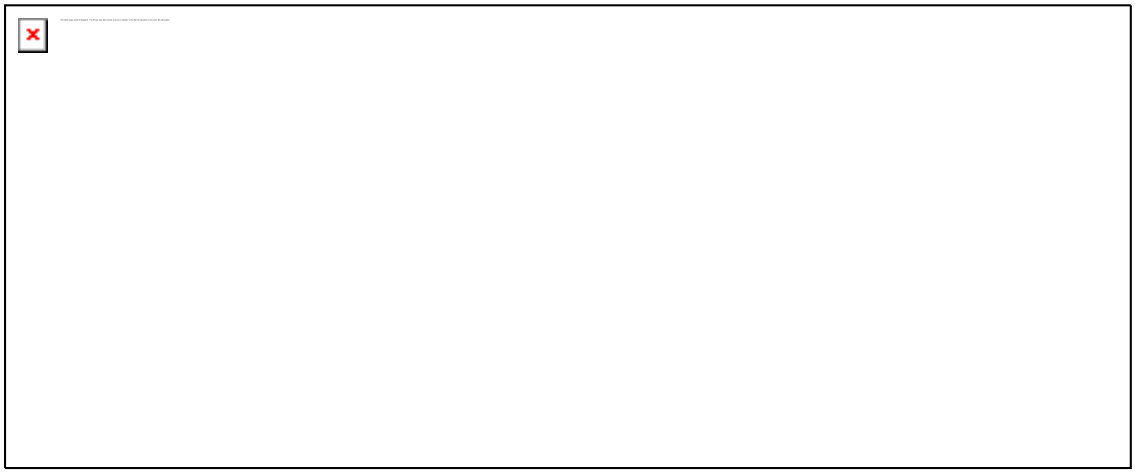
Note: Cameras 6 and 8 in Figure 2 above are MobileView SideEye cameras. Camera 2 is a MobileView forward-facing camera. For installation of these cameras, see their respective manuals, shown in “References and related documents” on page 6.

Camera cable guidelines

When installing camera cable, follow these guidelines:

- Avoid excessive lengths of cable at the control and device end. Pull back excess cable to a duct area where it can be folded and secured. Leave a service loop as directed for specific devices.
- Cables should not come into contact with bare metal edges, light ballasts, or magnetic speaker coils. If ballasts and speaker coils cannot be avoided, cross them perpendicularly.
- Do not tighten cables that are secured with cable-ties to the extent that the cable is compressed or damaged. Do not crimp, crush, or severely bend the cables.
- When passing cables through tapping plates or metal sidewalls of the vehicle, if possible, insert grommets in the holes to protect the cables. If it is not possible, make sure that the protective outer CL2 jacket is maintained when passing the cables through the holes.
- When pulling cable through the conduit, do not jerk or overpull the cables. These actions will stretch and damage the cable. If you must pull cables through vehicle walls with limited access or conduit, attach a pull line to the cable jacket, not to the connector, and gently pull the cable through the appropriate routing paths.
- Route cables from each camera location to the DVR location as determined by your specific system layout. Figure 3 on page 10 shows an example of cabling layout.
- After reaching camera locations, leave enough cable for a 6 in. (152 mm) service loop at each location.

Figure 3: Typical eight-camera cabling layout



1. Front door camera
2. Forward-facing camera
3. Front-to-rear camera
4. Rear exit camera
5. Rear-to-front camera
6. SideEye side camera
7. Center-to-rear camera
8. SideEye rear camera
9. DVR location

Installing camera assemblies

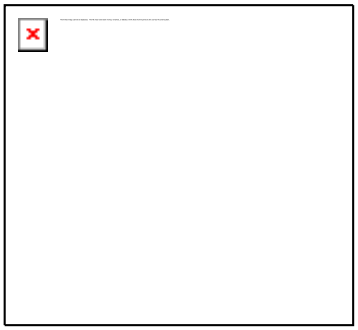
The MobileView system supports up to eight cameras (color and monochrome). Cameras supported by the MobileView system provide a 1.0 Vp-p composite analog video signal, at 75 Ω (CCTV standard).

Note: In some installations, it is necessary to use a metal tapping plate behind the mounting surface. If you are using a tapping plate, prepare it the same way as the mounting surface. Drill a cable entry hole and mounting holes in the appropriate locations.

Surface-mounted cameras

It is typical to install surface-mount camera housings on the ceiling, but you can also mount the housings on any flat vehicle surface. Mounting hole locations are shown in Figure 4 on page 11.

Figure 4: Mounting holes



1. Cable entry hole
2. Mounting hole
3. Mounting hole slot

To surface mount a camera housing:

1. Use the template in Figure 64 on page 102 to mark the location of the cable-entry hole and two mounting holes (see Figure 4 above).
2. Using a 3/16 in. (5 mm) drill bit, drill the two mounting holes.
3. Using a 1 in. (25 mm) drill bit, drill the cable entry hole.
4. Install a 3/4 in. (20 mm) (interior diameter) grommet on the cable entry hole, or where feasible.
5. Connect the video and power cables to the camera, and then feed the excess cable into the vehicle's duct area.
6. Mount the camera and mounting plate onto the vehicle surface and tapping plate, if used. Do not put the screw in the center of the mounting hole slot (Figure 5).
7. To align the camera's field of view, see "Adjusting the camera's field of view" on page 13.
8. Use a thread-locking compound, which prevents screws from vibrating, to secure the surface-mount housing to the mounting plate with the four 3/8 in. tamper-resistant tamper-torque machine screws (Figure 6).

Figure 5: Mounting plate installation

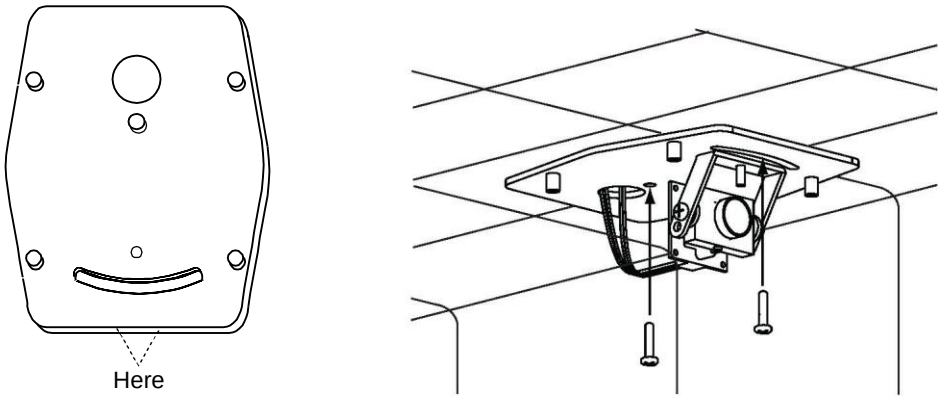
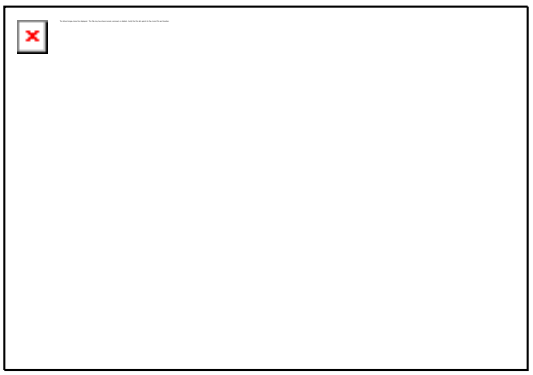


Figure 6: Surface-mount housing installation



Flush-mounted cameras

There are two types of flush-mount cameras—square and angled. Flush-mount camera assemblies are mounted flush with the side panels of the vehicle.

Note: The square bezel that holds the glass camera cover has countersunk holes in the back face that cover the two housing screws. The housing and bezel screws are separated to allow access to the camera for focusing and adjusting while the housing is held firmly in place.

To flush-mount a camera housing:

1. Leave at least 6 in. (152 mm) of clearance behind the mounting location.
2. Cut a 3.25 x 3.25 in. (83 x 83 mm) hole in the appropriate location on the mounting surface.
3. Using the housing as a template, mark the location of the mounting holes.
4. Using a 3/16 in. (5 mm) drill bit, drill the mounting holes.

5. Connect the video and power cables to the camera assembly.
6. Mount the camera assembly to the vehicle surface using two fasteners screwed into panel nuts (Figure 7).
7. To align the camera's field of view to the appropriate angle, see "Adjusting the camera's field of view" below .
8. Attach the cover plate to the housing (Figure 8 below). If you are installing a square housing, you must drill two additional mounting holes for the cover plate.

Figure 7: Camera housing installation

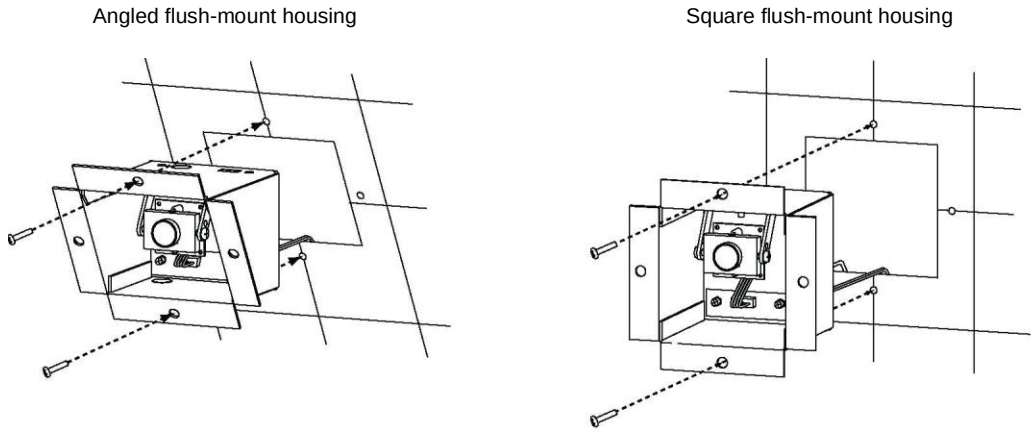
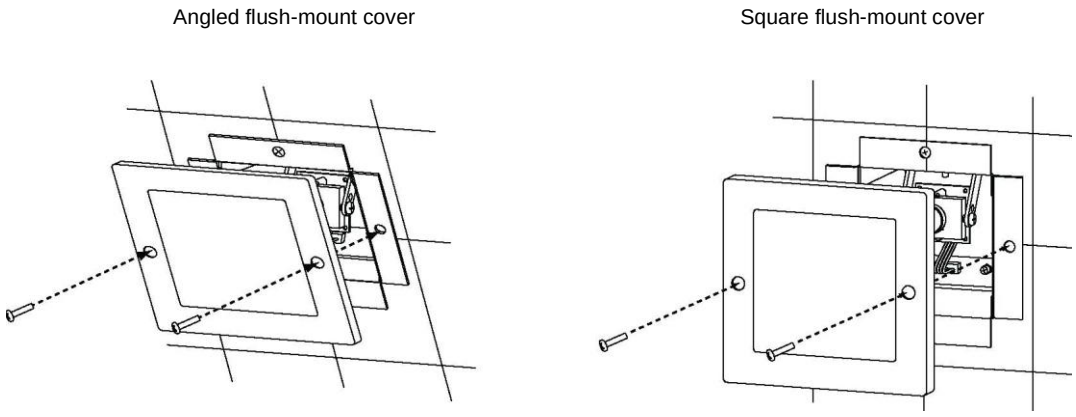


Figure 8: Cover installation



Adjusting the camera's field of view

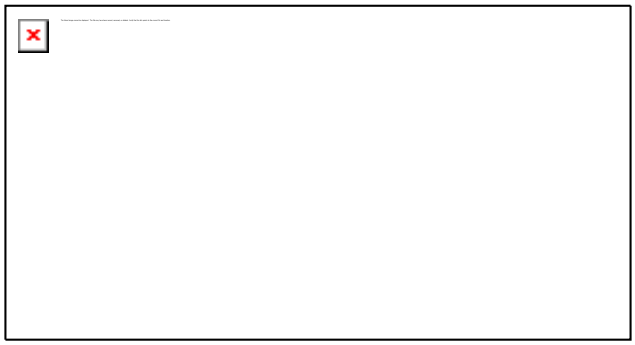
Depending on the camera's location, you might have to adjust the camera angle to provide the best field of view. Adjusting the camera angle might include

altering the horizontal or vertical angles of the camera and, for surface-mount cameras, using a spacer. See Figure 9 below.

To adjust the vertical angle:

1. Loosen the camera's pivot screws.
2. Rotate the camera to the correct angle.
3. Retighten the pivot screws.

Figure 9: Adjusting the camera's vertical angle

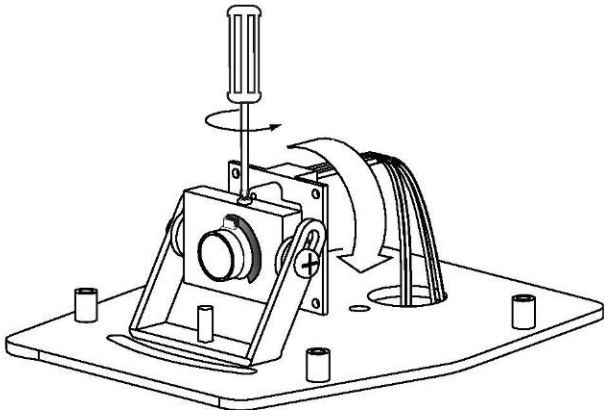


Surface-mount cameras are configured at the factory to be installed onto the ceiling of the vehicle. You can rotate the camera lens if you are installing a surface-mount camera on the side of the vehicle. See Figure 10 below.

To rotate the camera lens:

1. Loosen the set screw on the top of the camera assembly.
2. Rotate the camera assembly at 90°.
3. Retighten the set screw.

Figure 10: Adjusting the camera's horizontal angle



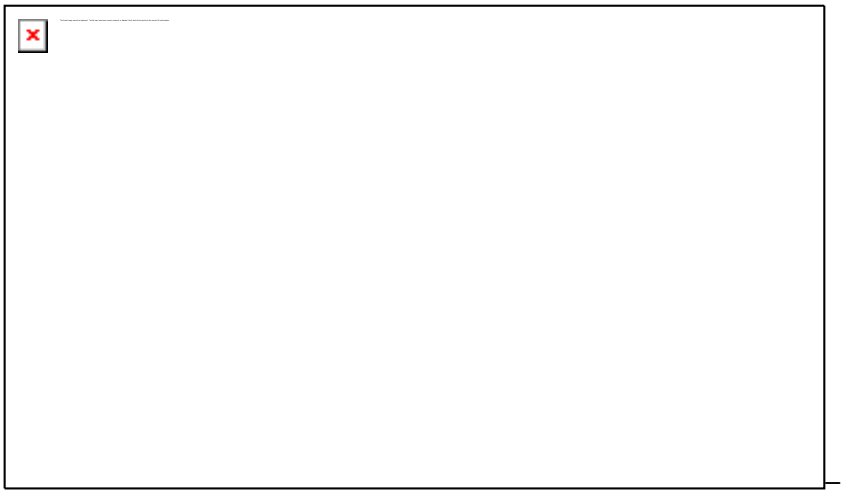
Caution: Overtightening the set and pivot screws can damage the camera's lens.

Mounting location adjustments

You can adjust the camera to allow for specific mounting locations on the vehicle. For cameras mounted on the street side of the bus or surface-mounted facing backward, you may need to invert the camera.

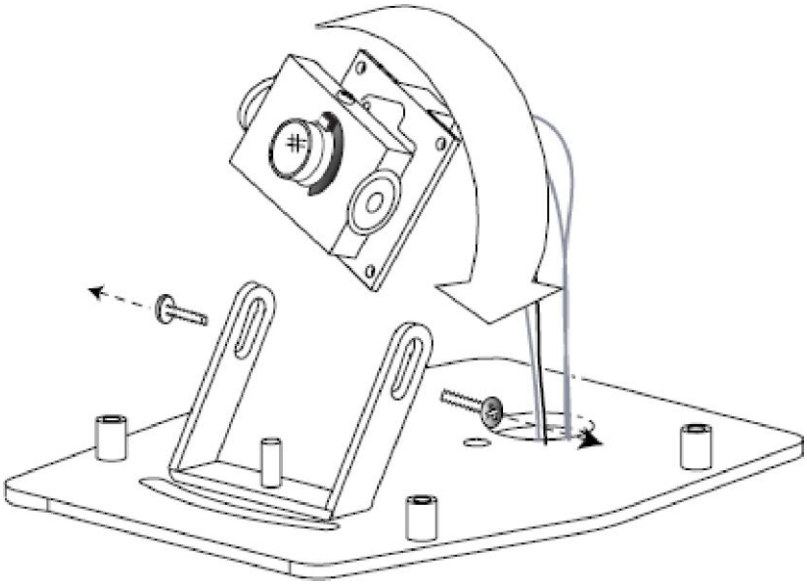
Figure 11 below shows the default orientation of a camera mounted on the curb side of the bus, the back of the bus, or in a forward-facing position on the dashboard. Note that the lens set screw and the wiring harness are at the top of the camera.

Figure 11: Loosening the camera from the mounting bracket



1. Lens set screw
2. Wiring harness

Figure 12: Inverting the camera

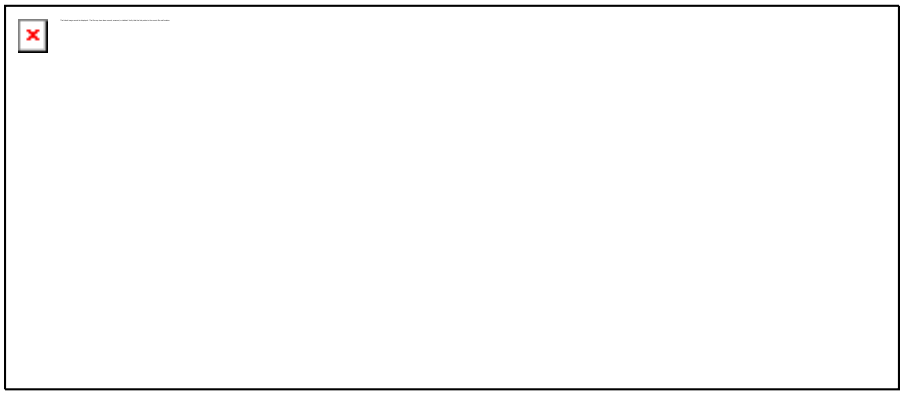


To adjust the camera's orientation:

1. For cameras mounted on the street side of the bus or surface-mounted facing backward, remove the two side set screws and lift the camera out of its bracket.
2. Rotate the entire camera assembly 180°.
3. Insert the camera into the bracket, and replace the set screws.

   The lens set screw and the wiring harness should be positioned at the bottom of the camera (Figure 13 below).

Figure 13: Reattaching the camera to the mounting bracket



1. Lens set screw
2. Wiring harness

Chapter 3
DVR installation

Summary

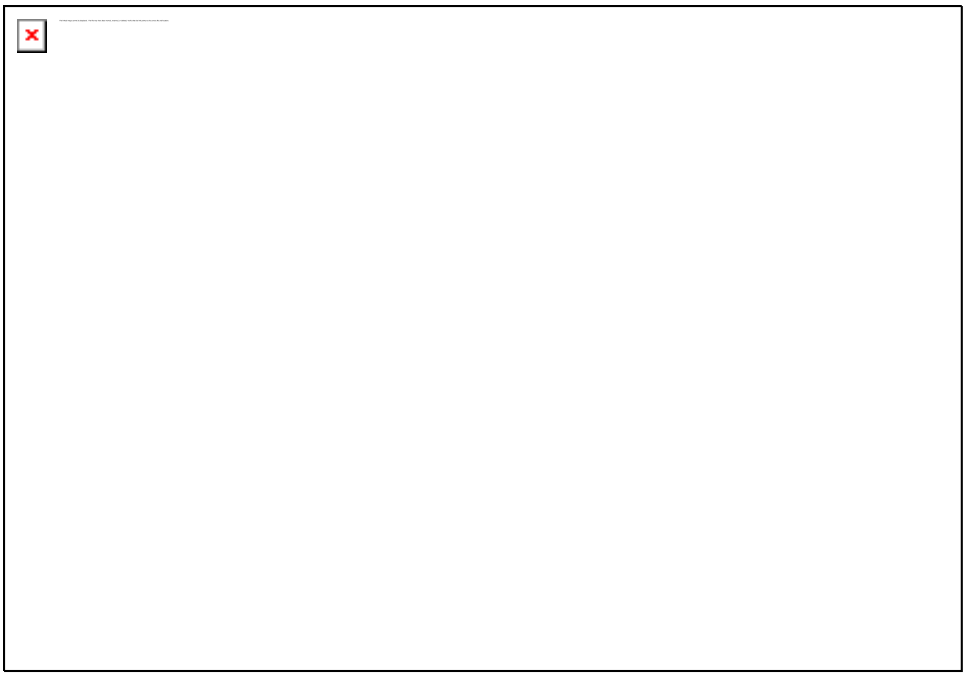
This chapter provides information on installing and wiring the MobileView PENTA DVR.

Content

Installation overview

The PENTA DVR is designed specifically for installation on public transit vehicles. This logistically assumes that certain mounting and wiring limitations common to that environment exist. The installation instructions provided in this chapter are tailored to that expectation.

Figure 14: Components of the DVR assembly



1. PENTA main housing
2. PENTA storage caddy

Locating the DVR

A mobile DVR is normally mounted within the vehicle’s electronics enclosure. Such enclosures vary in size and location, depending on the vehicle make and model. In general, the electronics enclosure provides adequate space for the DVR. For most vehicles, this is located behind the driver, and is typically lockable and climate-controlled. When deciding where to place the DVR, ensure that the space adequately protects against liquid and foreign material intrusion, and provides sufficient ventilation to maintain a 0 to 55°C operating temperature range.

Mounting the DVR

The PENTA is designed to resist shock and vibration forces commonly observed on a transit vehicle. Resistance to specified levels is only obtained when the DVR is secured to a stationary (with respect to the vehicle), vibration-resistant, and horizontal surface, as shown in Figure 15 below. Mounting the DVR in a way that does not meet these requirements may result in undesired performance.

To mount the DVR housing:

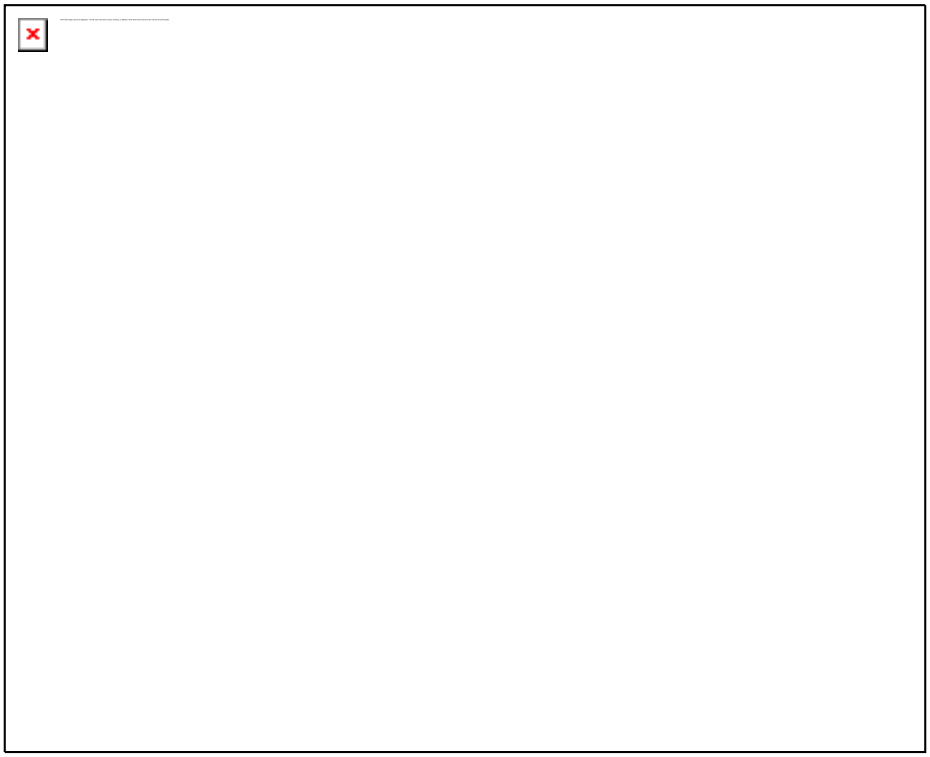
1. On a flat, stationary, and vibration-resistant surface, use the DVR mounting plate as a template to mark and drill four mounting holes.

   See Appendix B “Templates and dimensions” on page 101 for the templates and dimensions and details on DVR mounting plate bolthole patterns.

2. Using bolts, locking washers, and nuts, mount the DVR base plate to the vehicle surface (see Figure 15 below).

   To resist vibration, we recommend using nuts with a thread locking compound or a self-locking nylon insert. Failure to use such devices may result in insecure mounting and damage to the unit.

Figure 15: Mounting the DVR

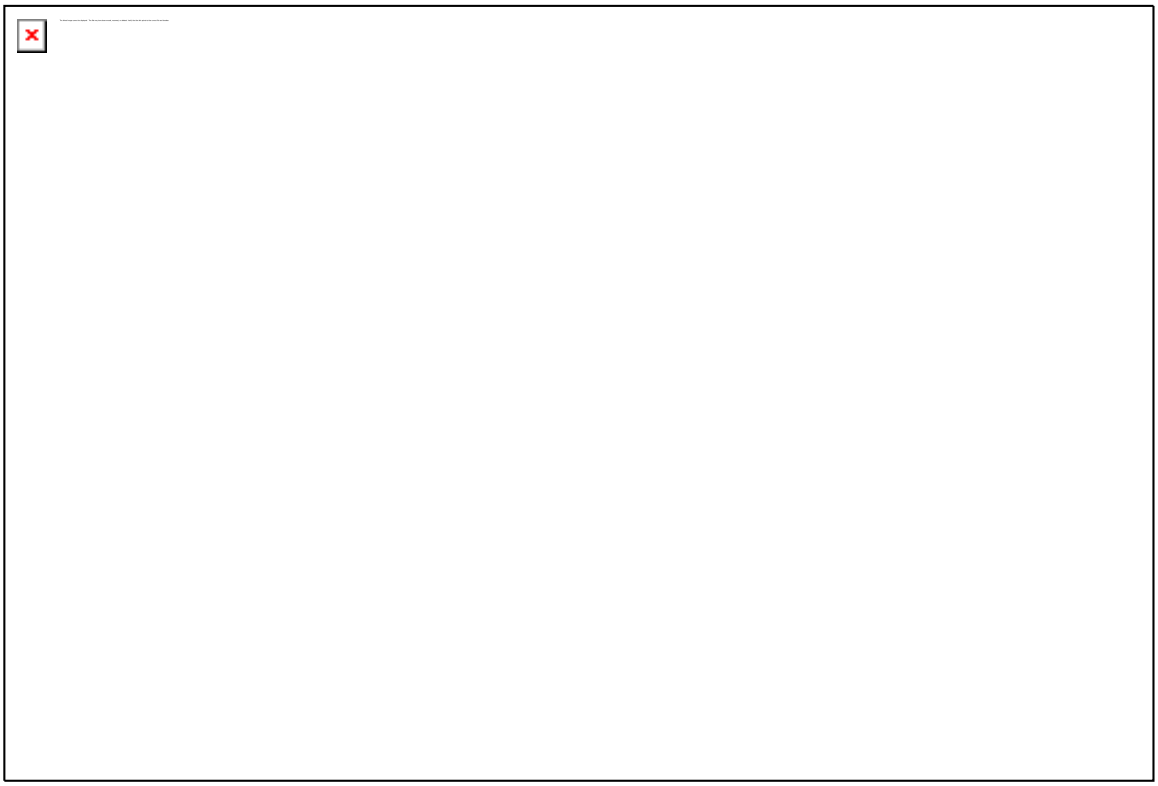


1. PENTA main housing
2. Mounting bolts (4)

Wiring

Wiring connections between the DVR and auxiliary devices are made on the DVR's side panel (Figure 16).

Figure 16: DVR side panel connections

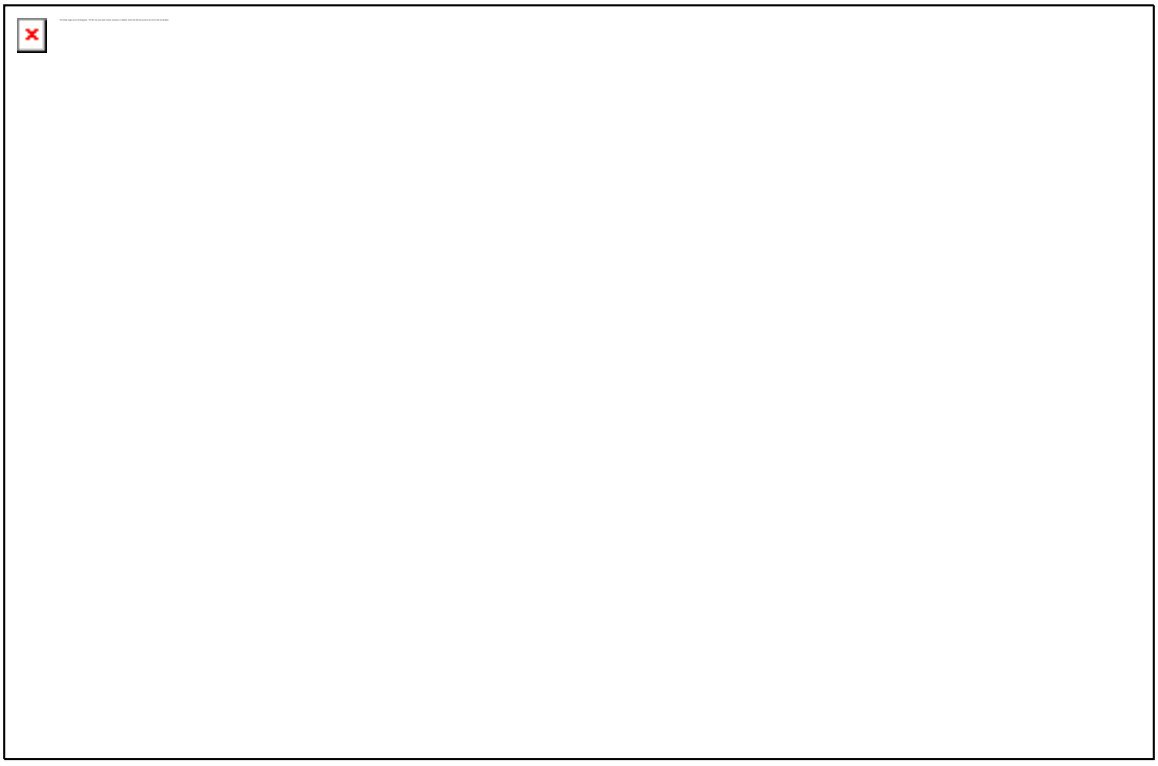


1. J6 video input connector
2. GPS
3. COM3, COM2
4. J3 digital input connector
5. Gigabit network
6. J5 analog and relay connector
7. USB 3, USB4
8. Mux
9. J1 power input connector
10. Power In Fuse
11. J2 audio and status LED connector
12. J4 camera power connector
13. 5V, 12V Power Out Fuse

Connectors and cable harnesses

The DVR has six primary connectors. These connectors are identified on the side panel as J1 through J6 (see Figure 17 below). The DVR supports wire attachment direct to J connector screw-down terminals or via optional wire harnesses. Each option has its own benefits and limitations depending on the type of installation. Only the J6 video input connector requires the use of a harness.

Figure 17: Cable harness connections



J1. Power input connector
J2. Audio and status LED connector
J3. Digital input connector
J4. Camera power connector
J5. Relay and analog connector
J6. Video input connector

Connecting the DVR

The subsequent sections provide information needed to attach field wires directly to the J connector. The equivalent harness connection information is also provided. In general, harnesses provide an easy means of connecting and disconnecting the DVR from the vehicle for service, maintenance, or repair.

All connectors are equipped with dual, vibration-resistant, screw-down retainers. The connector must be fully seated and each screw-down tightly engaged to ensure the connector remains in place during normal operation.

WARNING: It is the installer's responsibility to ensure all power is off before connections are made. We recommend checking all power connections for shorts and grounds before applying power. Failure to follow this recommendation may result in damage to the vehicle or the DVR, as well as injury to the installation personnel.

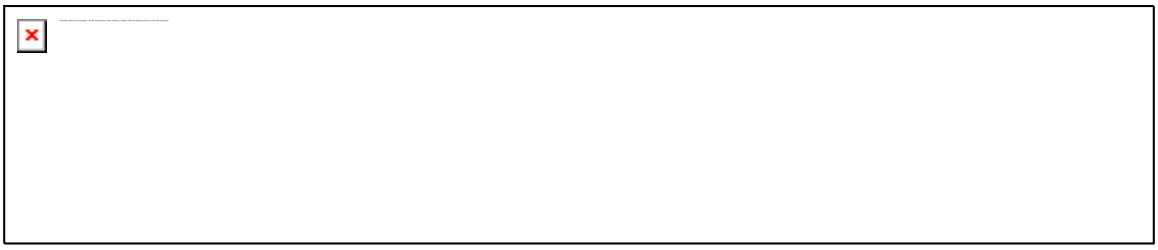
J1 input power connections

Main power, ground, and ignition are supplied to the three-terminal Phoenix connector labeled J1 on the DVR. In addition to onboard fuses, we recommend external inline fusing with the main power and ignition inputs as shown in Figure 18 below.

The J1 connector uses both locking clips and retaining screws to ensure that it does not disconnect during operation. By design, this makes the connector logistically difficult to remove. To remove the connector, fully loosen the retaining screws and gently rock the connector side to side while pulling the connector away from the DVR chassis. The connector eventually pulls free.

Note: The DVR is designed to work with a continuous main power source. Using an intermittent power source requires special circuitry as detailed in "Battery disconnect systems" on page 26.

Figure 18: J1 main power connections



To connect power:

1. Run a three-conductor 16 AWG cord from the vehicle power, electrical ground, and ignition source locations to the DVR.

   Note: We recommend adding a 10 A inline, fast-blow fuse to the main power line and a 1 A inline, fast-blow fuse to the ignition input.

2. With the vehicle power off, make connections to the vehicle power and ignition sources.

   Contact the vehicle manufacturer for information on connecting to the vehicle power source.

3. At the DVR, remove the J1 connector and terminate each wire to the proper terminal as shown in Figure 18 on page 24.

4. Before reattaching the J1 connector, turn on the power and use a voltmeter to check each terminal for proper voltage and polarity.

   Main power and ignition voltages should be nominal 12 or 24 VDC.

   Note: MobileView PENTA supports nominal SAE base vehicle voltages of 12 and 24 VDC.

5. After confirming voltages and polarities are correct, remove the power, plug the connector into the J1 receiver, and then tighten the retaining screws.

J1 harness connections

The J1 harness couples a 6-pin Molex type connector to the J1 connector (Figure 19 below). This arrangement provides dedicated termination points for main power, ground, and ignition. Common and specific usage of each termination point is provided in Table 1 below. Looping outputs are generally used to power and control the MobileView wireless network transmission device.

Figure 19: Main power connection

Table 1: J1 harness pinout

6-pin Molex	Color	Use	J1 block
1	Red	Main power in	J1.1
2	Black	Return in	J1.2
3	White	Ignition in	J1.3
4	Red	Main power out	J1.1
5	Black	Return out	J1.2
6	White	Ignition out	J1.3

Battery disconnect systems

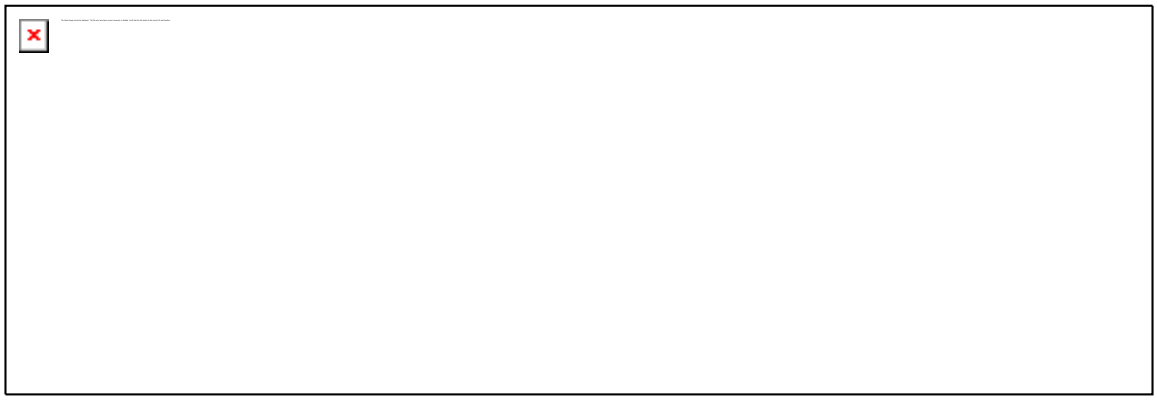
Many vehicles incorporate a source disconnect device, commonly called a battery disconnect or knife switch. This device removes power to noncritical systems during routine maintenance or to inhibit long-term battery drain. When the DVR is connected to such a device, it is subject to immediate and uncontrolled loss of power. As a continuous, real-time recording device, uncontrolled power loss can negatively affect expected system performance.

We have defined two wiring configurations based on the use of a battery disconnect switch: standard wiring configuration and delay off wiring configuration.

Standard wiring configuration

Sites that shut down the DVR before activation of the source disconnect device commonly use the standard wiring configuration as shown in Figure 20 below. Refer to instructions on using the maintenance plug for manually shutting down the DVR.

Figure 20: Standard power and ignition wiring diagram



Delay off wiring configuration

Sites that routinely use a source disconnect device and do not manually shut down the DVR with the maintenance plug must implement a delayed shutdown wiring scheme equivalent to those shown in Figure 21 on page 27 or Figure 22 on page 27.

In both diagrams, the relay device specified supports a variable time delay of 1 to 100 seconds. When connected to a PENTA DVR, the delay must be set for 10 seconds or greater.

Figure 21: Alternative power and ignition wiring diagram - 12 VDC

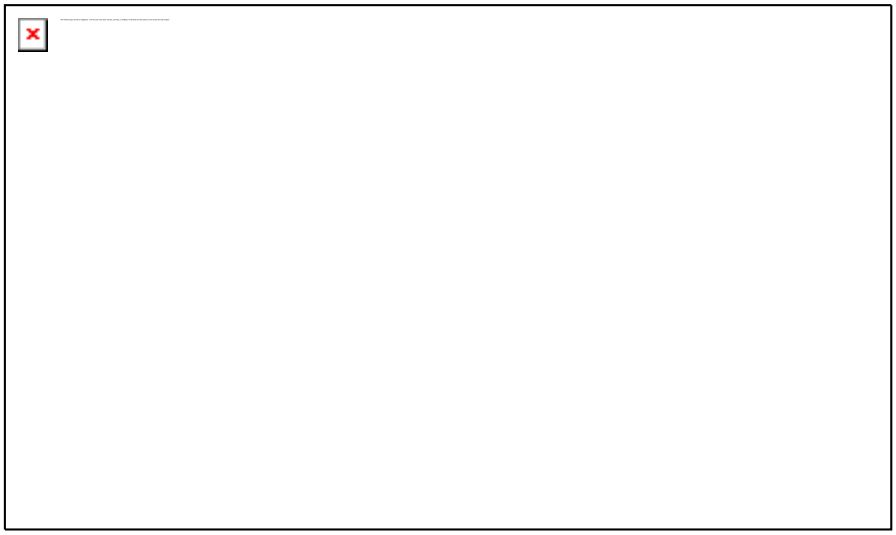


Figure 21 above depicts integration of a delay before break relay from ABB Incorporated into the power and ignition circuit of a PENTA DVR. The relay specified works with 12 VDC systems. Model KRDB1110S is wired exactly the same as above but is fixed at 10 seconds.

Figure 22: Alternative power and ignition wiring diagram - 24 VDC

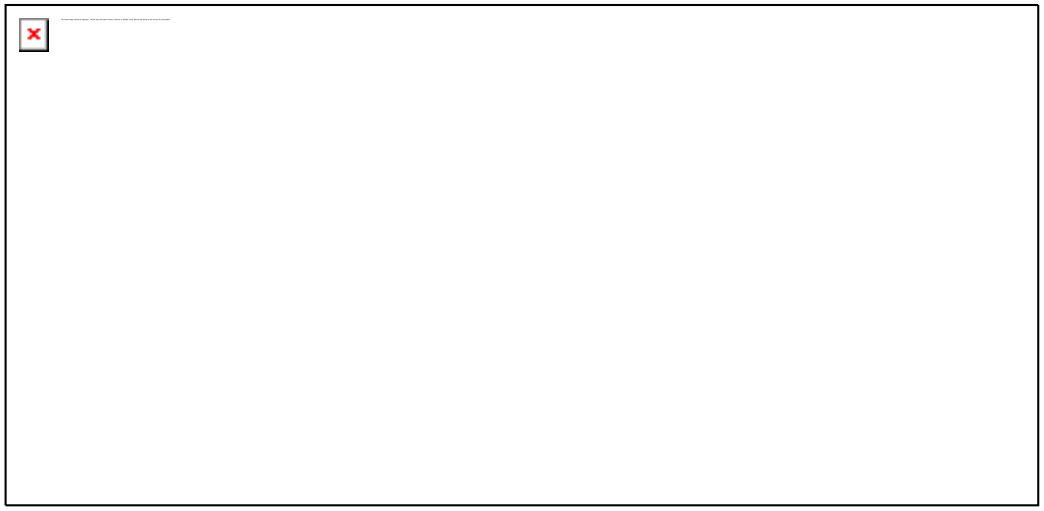


Figure 22 above depicts integration of a delay before break relay from ABB Incorporated into the power and ignition circuit of a PENTA DVR. The relay specified works with 24 VDC systems. Model KRDB2110S is wired exactly the same as above but is fixed at 10 seconds.

The relays shown in Figure 21 and Figure 22 have been checked by UTC and found to function in an expected and repeatable manner. We do not provide nor

specifically recommend the specified relays since any “delay before break” time delay relay meeting similar requirements may be used.

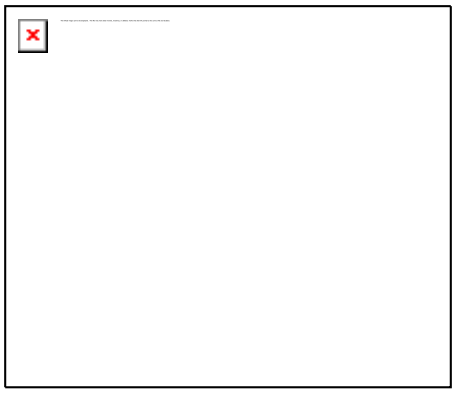
Note: Digital input 7 in Figure 21 and Figure 22 is used to monitor the status of the power disconnect device. The installer must configure an event to immediately shut down the DVR when Digital Input 7 deactivates. Refer to “Alarm events” on page 57 for more information on setting up events.

J2 audio and status connections

The MobileView PENTA provides two audio inputs and two status outputs on the eight-terminal Phoenix connector labeled J2 (see Figure 23 below). More information on the connection of specific terminals to optional hardware devices can be found in Chapter 5 “Optional hardware installation” on page 67.

The J2 connector uses retaining screws to ensure that it does not disconnect during operation. By design, the connector is easily removed if the retaining screws are fully disengaged and a slight force perpendicular to the connector is applied. Ensure that the retaining screws are fully engaged or unwanted disconnection may occur.

Figure 23: J2 audio and status connection



Audio connections

The MobileView PENTA supports two channels of audio recording on line level inputs. Each audio channel is one half of a stereo input. Audio input 1 is the left channel and audio input 2 is the right channel. During playback, filtering between the audio inputs is accomplished using the balance tool on the playback computer.

See “Installing a microphone” on page 76 for more information on connecting a microphone to the DVR in both single and dual channel configurations.

Status connections

The camera and software LED outputs provide a quick means of determining the operating status of the DVR.

- Camera LED. This output is normally inactive and turns ON when a fault condition occurs in the DVR. The most common fault is video loss from a configured camera.
- Software LED. This output is normally active and turns OFF if the DVR software stops running.

Note: If the software is not running, neither the camera nor software LED outputs will work.

These open collector outputs are designed to work with the MobileView MSS-4008 series status devices. The devices are equipped with one red and green LED. The red LED is reserved for connection to the camera output and the green LED to the software output. For more information, see “Installing a panic button” on page 74.

J2 harness connections

The J2 harness couples a 14-pin Molex-type connector to the J2 connector (see Figure 24 below). This arrangement provides dedicated termination points for audio input, microphone power, and DVR status outputs along with spare voltage and ground points. Common and specific usage of each termination point is provided in Table 2 below.

Figure 24: J2 cable harness

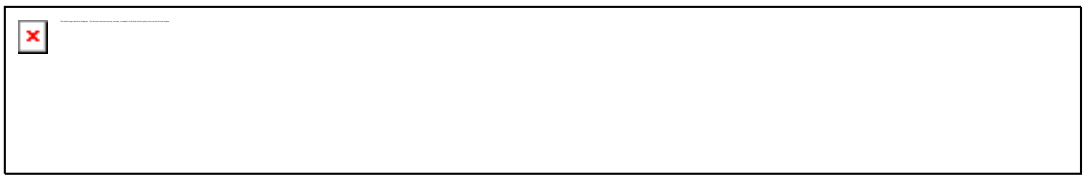


Table 2: J2 harness pinout

14-pin Molex	Color	Use	J2 block
1	Brown	AUD1+	J2.2
2	Yellow	AUD2+	J2.3
3	Blue	12 V (Mic 1 power)	J2.1
4	Blue	12 V (Mic 2 power)	J2.1
5	Blue	12 V (Status LED power)	J2.1
6	Orange	5 V (Spare)	J2.4

14-pin Molex	Color	Use	J2 block
7	Blue	12 V (Spare)	J2.1
8	Black	GND (AUD1 Return)	J2.5
9	Black	GND (AUD2 Return)	J2.5
10	Black	GND (Mic 1 PWR Return)	J2.5
11	Black	GND (Mic 2 PWR Return)	J2.5
12	Red	RED Status LED (Camera)	J2.6
13	Green	Green Status LED (Software)	J2.7
14	Black	GND (Spare)	J2.8

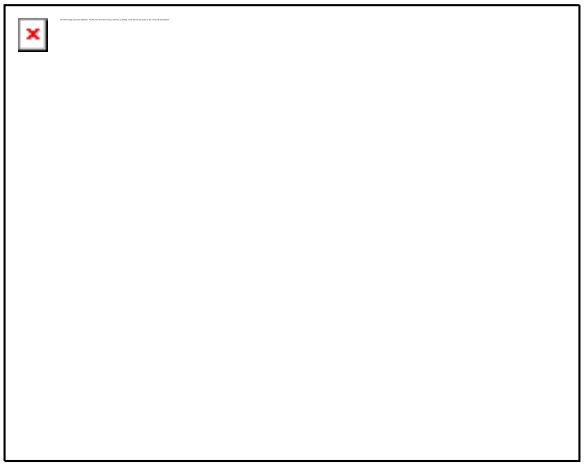
Note: The audio inputs are two monaural halves of a stereo input. The input is 1V RMS line level. Connection to input signals over 1V RMS can cause result in distorted audio.

J3 digital input channel connections

The MobileView PENTA provides eight digital inputs on the ten-terminal Phoenix connector labeled J3 (see Figure 25 on page 31). Connection of specific terminals to optional hardware devices is detailed in Chapter 5 “Optional hardware installation” on page 67.

The J3 connector uses retaining screws to ensure that it does not disconnect during operation. By design, the connector is easily removed if the retaining screws are fully disengaged and a slight force perpendicular to the connector is applied. Ensure that the retaining screws are fully engaged or unwanted disconnection may occur.

Figure 25: J3 digital inputs connection



Digital inputs

Each open collector digital input treats an input voltage between 5 to 30 VDC with respect to digital ground as activated or closed. Inputs less than 1 VDC are treated as deactivated or open. Voltages between 1 to 4 VDC have no guarantee of being seen as activated or deactivated.

Refer to Chapter 5 “Optional hardware installation” on page 67 for more information on connecting digital inputs to peripheral devices.

Ground link

As stated above, digital input voltages are measured with respect to digital ground. The ground link jumper connects the DVR electrical ground to the digital ground. For special installations where a digital input electrical reference return is different from the DVR electrical ground or where ground isolation is needed, remove the ground link jumper and attach the alternate ground reference to connector J3, terminal 10.

WARNING: Never connect the MobileView PENTA electrical ground or chassis to systems with different ground references. Doing so could damage both systems or create a potential for electrical shock.

J3 harness connections

The J3 harness couples an 18-pin Molex type connector to the J3 connector (see Figure 26 on page 32). This arrangement provides dedicated termination points for each digital input, two digital ground, and eight 12 VDC (+) outputs. Common and specific usage of each termination point is provided in Table 3.

Figure 26: J3 harness, digital input connection

Table 3: J3 harness pinout

18-pin Molex	Color	Use	J3 block
1	Yellow	Digital input 1	J3.1
2	Red	Digital input 2	J3.2
3	White	Digital input 3	J3.3
4	Blue	Digital input 4	J3.4
5	Brown	Digital input 5	J3.5
6	Orange	Digital input 6	J3.6
7	Purple	Digital input 7	J3.7
8	Grey	Digital input 8	J3.8
9	Black	Ground	J3.10
10	Green	12V (Digital 1)	J3.9
11	Green	12V (Digital 2)	J3.9
12	Green	12V (Digital 3)	J3.9
13	Green	12V (Digital 4)	J3.9
14	Green	12V (Digital 5)	J3.9
15	Green	12V (Digital 6)	J3.9
16	Green	12V (Digital 7)	J3.9
17	Green	12V (Digital 8)	J3.9
18	Black	Ground	J3.10

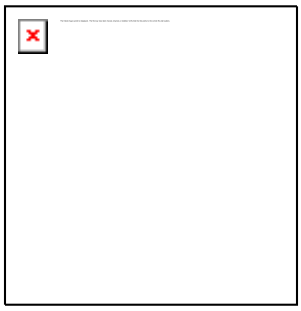
J4 camera power connections

MobileView PENTA provides two 12 VDC camera power outputs on the four-terminal Phoenix connector labeled J4 on the DVR (see Figure 27 on page 33).

The J4 connector uses retaining screws to ensure it does not disconnect during operation. By design, the connector is easily removed if the retaining screws are

fully disengaged and a slight force perpendicular to the connector is applied. Ensure retaining screws are fully engaged or unwanted disconnection may occur.

Figure 27: J4 camera power connection



Output limits

The total current draw for all 12 VDC outputs should not exceed 3 A.

Note: Although cameras draw the most total current on a system, all 12 VDC devices powered by the DVR must be considered when calculating the current draw.

J4 harness connections

The J4 harness couples eight two-pin Molex type connectors to the J4 connector (see Figure 28 below). This arrangement provides dedicated termination points for each camera power connection. Common and specific usage of each termination is provided in Table 4 on page 34.

Figure 28: J4 harness, camera power connection (PENTA 8 channel)

The PENTA 8 channel power harness is shown above. The PENTA 16 channel harness adds eight additional 2-pin power connectors to accommodate additional camera power outputs. See Table 4 on page 34 for both 8 & 16 channel harness pinouts.

Table 4: J4 harness pinout

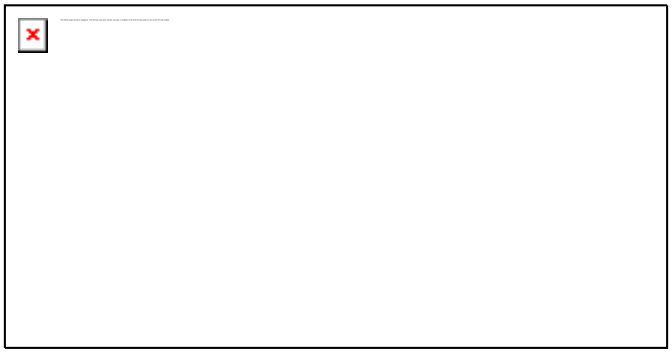
Camera	2 -pin Molex	Color	Use	J4 block	USE
1	1	Red	12V	J4.1	CAM PWR, CH 1
	2	Black	GND	J4.3	
2	1	Red	12V	J4.1	CAM PWR, CH 2
	2	Black	GND	J4.3	
3	1	Red	12V	J4.1	CAM PWR, CH 3
	2	Black	GND	J4.3	
4	1	Red	12V	J4.1	CAM PWR, CH 4
	2	Black	GND	J4.3	
5	1	Red	12V	J4.2	CAM PWR, CH 5
	2	Black	GND	J4.4	
6	1	Red	12V	J4.2	CAM PWR, CH 6
	2	Black	GND	J4.4	
7	1	Red	12V	J4.2	CAM PWR, CH 7
	2	Black	GND	J4.4	
8	1	Red	12V	J4.2	CAM PWR, CH 8
	2	Black	GND	J4.4	
9	1	Red	12V	J4.1	CAM PWR, CH 9
PENTA 16CH	2	Black	GND	J4.3	
10	1	Red	12V	J4.1	CAM PWR, CH 10
PENTA 16CH	2	Black	GND	J4.3	
11	1	Red	12V	J4.1	CAM PWR, CH 11
PENTA 16CH	2	Black	GND	J4.3	
12	1	Red	12V	J4.1	CAM PWR, CH 12
PENTA 16CH	2	Black	GND	J4.3	
13	1	Red	12V	J4.2	CAM PWR, CH 13
PENTA 16CH	2	Black	GND	J4.4	
14	1	Red	12V	J4.2	CAM PWR, CH 14
PENTA 16CH	2	Black	GND	J4.4	
15	1	Red	12V	J4.2	CAM PWR, CH 15
PENTA 16CH	2	Black	GND	J4.4	
16	1	Red	12V	J4.2	CAM PWR, CH 16
PENTA 16CH	2	Black	GND	J4.4	

J5 analog, audio out, and relay output connections

The MobileView PENTA provides two Form C relay outputs, dual channel audio output, and two analog inputs on the twelve-terminal Phoenix connector labeled J5 (Figure 28). These connections are for general use and can be used for any number of special or site-specific applications. There is no standard usage for these connections.

The J5 connector uses retaining screws to ensure that it does not disconnect during operation. By design, the connector is easily removed if the retaining screws are fully disengaged and a slight force perpendicular to the connector is applied. Ensure that the retaining screws are fully engaged or unwanted disconnection may occur.

Figure 29: J5 analog, audio out, relay output connection



Analog input

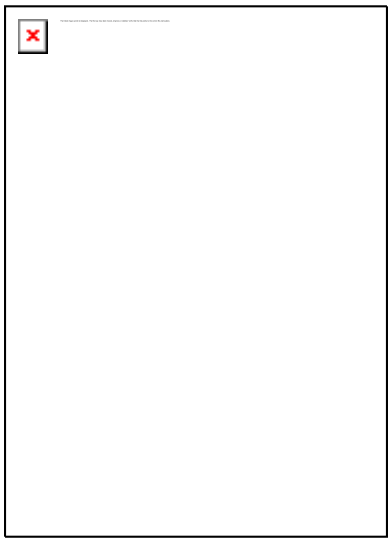
The DVR provides two analog inputs. These inputs convert the continuous voltage sensed at the terminal into a discrete numeric representation of the instantaneous value. Once converted, analog values above or below set points can be identified as discrete events, against which specific system responses can be programmed. A potential usage of the analog input is tracking temperature fluctuations of key vehicle systems.

Not all vehicle systems that might be monitored provide a voltage output. When one is not available, a conversion device with corresponding voltage output is required. Such devices are specific to the monitored system and UTC neither provides nor specifies them.

The analog to digital converter on the DVR is an eight-bit device supporting up to 255 discrete set points. Set points range between 0 to 254 and correspond to an input voltage range of 0 to 30 VDC. If full-scale input voltage is less than 30 VDC, then only a corresponding range of the 255 set points will be available.

If full-scale input is greater than 30 VDC, the input voltage must be reduced to fall within the supported range. Voltage reduction may be accomplished using a simple voltage divider network (see Figure 30 below).

Figure 30: Voltage divider, analog input



In Figure 30 above, a certain amount of the input voltage (Vin) is expended across resistor R1. The remaining voltage, Vout, is routed and monitored by the analog input. It is up to the installer to determine the proper values of R1 and R2 based on specified voltage input variables.

The value of VOUT is determined by the formula below.

```
Vout = (R2 * Vin) / (R1 + R2)
```

Since DVR analog inputs support a maximum voltage input of 30 VDC, Vout is always 30 VDC. For most applications, R2 can be set to 10 kΩ and the value of Vin is the full scale value of the voltage input to be measured. Solving the above equation for variable R1 allows simple calculation of its required value.

```
R1 = (R2 * Vin / Vout) - R2
```

In the example above, to monitor a 40 VDC variable input using a DVR analog input would require an R1 of 3.3 kΩ with an R2 of 10 kΩ.

```
R1 = (R2 * Vin / Vout) - R2
R1 = (10 kΩ * 40 VDC / 30 VDC) – 10 kΩ
R1 = 3.3 kΩ
```

Audio output

The audio outputs are two monaural halves of a stereo output. The output is 1V RMS line level and requires amplification by an external system.

Note: Connection to on-vehicle audio systems requires special configuration on both the DVR and the amplification system. Harness-based connection is not provided. Consult your UTC sales representative or technical support before connecting to external audio systems.

Relay output

Relay contacts are shown in their de-energized state and are rated for 200 mA maximum current draw.

J5 harness connections

The J5 harness couples a ten-pin Molex type connector to the J5 connector (Figure 30). Except for audio output, this arrangement provides dedicated termination points for each connection. Common and specific usage of each termination point is provided in Table 5.

Figure 31: J5 harness, analog, audio output, and relay connection

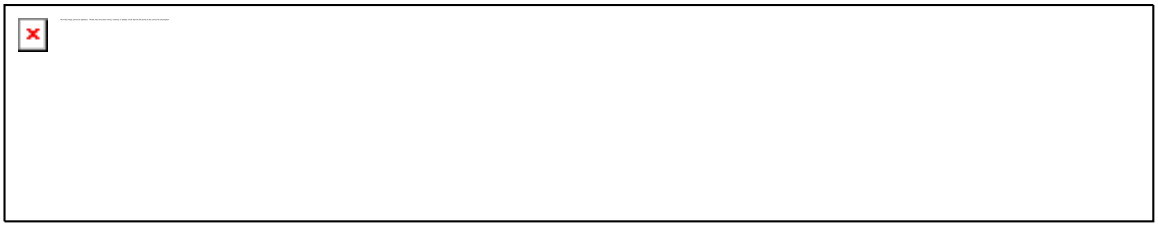


Table 5: J5 harness pinout

10-pin Molex	Color	Use	J5 block
1	Yellow	Analog input 1	J5.1
2	Red	Analog input 2	J5.2
3	White	Relay 1 NC	J5.7
4	Blue	Relay 1 NO	J5.9
5	Brown	Relay 1 common	J5.8
6	Black	GND	J5.3
7	Black	GND	J5.3
8	Orange	Relay 2 NC	J5.10
9	Purple	Relay 2 NO	J5.12
10	Gray	Relay 2 Common	J5.11

J6 video input connections

The MobileView PENTA provides eight BNC type video inputs on the miniature DIN connector labeled J6 (see Figure 32 below). Access to these video inputs requires attachment of the J6 harness described below.

The J6 connector uses retaining screws to ensure that it does not disconnect during operation. By design, the connector is easily removed if the retaining screws are fully disengaged and a slight force perpendicular to the connector is applied. Ensure that the retaining screws are fully engaged or unwanted disconnection may occur.

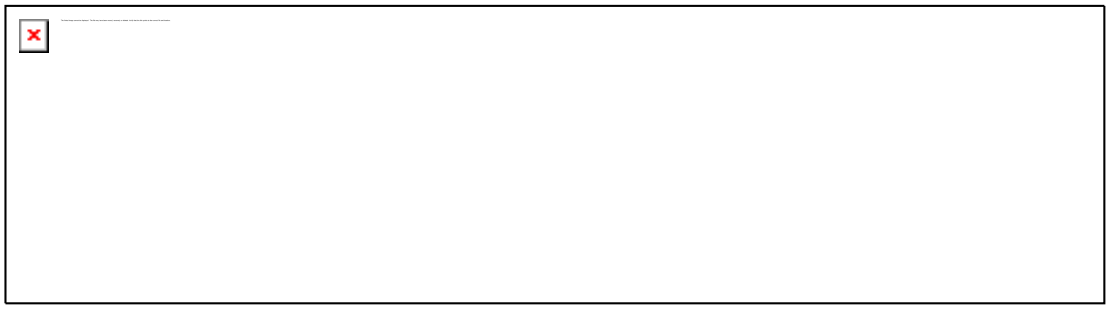
Figure 32: J6 video input connection

J6 harness connections

The J6 harness couples eight or sixteen BNC barrel type connectors to the J6 connector (see Figure 33 below). This arrangement provides dedicated termination points for each video input. Each BNC is color-coded and labeled to indicate the assigned video input number. See Figure 33 below and

Table 6 on page 39 for added detail on J6 harness color code and video input assignments.

Figure 33: J6 harness, video cable (PENTA 8 channel)



The PENTA 8 channel video harness is shown above. The PENTA 16 channel harness adds eight additional BNC barrel connectors to accommodate additional video inputs. See

Table 6 on page 39 for both 8 & 16 channel harness pinouts.

Table 6: J6 harness pinout

BNC barrel	Color	USE
1	Yellow	Video Input Channel 1
2	Red	Video Input Channel 2
3	White	Video Input Channel 3
4	Blue	Video Input Channel 4
5	Brown	Video Input Channel 5
6	Orange	Video Input Channel 6
7	Purple	Video Input Channel 7
8	Grey	Video Input Channel 8
9 (PENTA 16 CH)	Yellow	Video Input Channel 9
10 (PENTA 16 CH)	Red	Video Input Channel 10
11 (PENTA 16 CH)	White	Video Input Channel 11
12 (PENTA 16 CH)	Blue	Video Input Channel 12
13 (PENTA 16 CH)	Brown	Video Input Channel 13
14 (PENTA 16 CH)	Orange	Video Input Channel 14
15 (PENTA 16 CH)	Purple	Video Input Channel 15
16 (PENTA 16 CH)	Grey	Video Input Channel 16

Maintenance plug

The maintenance plug (Figure 34) lets you start or shut down the MobileView PENTA DVR manually. You might need to force a manual shutdown to remove or swap the hard drive caddy. It is also useful to force DVR shutdown for routine maintenance purposes.

Figure 34: Maintenance plug

Startup

To start the DVR when it is off, insert the maintenance plug into either the upper or lower PS2 port. If main power is present, the DVR starts up. Initially the software and camera LEDs flash on the status device and the LCD displays the words WDOG OFF. When the DVR software starts, the LEDs stop flashing, the LCD message WDOG OFF clears, and the DVR enters a normal operating state. Removal of the maintenance plug has no affect on the system. If the ignition input is deactivated, the system's shutdown timer sequence will activate. Upon expiration of the shutdown dwell time, the DVR shuts down.

Shutdown

To shut down the DVR while it is running normally or during the delayed shutdown time, insert the maintenance plug into either the upper or lower PS2 port. The DVR immediately begins an orderly shutdown. The DVR remains off while the maintenance plug is in place. If, upon removal of the maintenance plug, if the ignition input is active, the DVR begins its startup sequence.

Chapter 4
DVR configuration

Summary

This chapter provides information to help you troubleshoot problems and contact technical support in case you need assistance with your equipment.

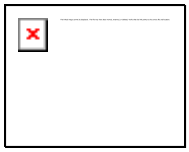
Content

Connecting to the DVR

Once the MobileView PENTA DVR has been installed, you can start configuring the device using a service laptop. To configure the device, you must have Video Manager installed in your laptop. The steps in this chapter assume Video Manager is already installed and configured. For more information on installing Video Manager, refer to the *MobileView Video Manager User Manual*.

To configure your laptop for direct connection to the DVR:

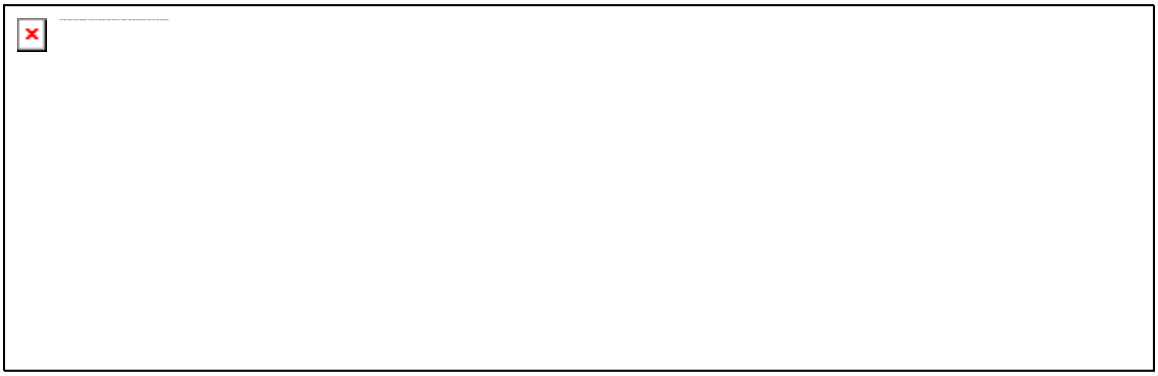
1. Connect an Ethernet crossover cable between your laptop Ethernet port and the DVR front Ethernet port.
2. On the laptop, open Network Connections (Start > Settings > Network Connections).
3. Set the laptop's IP address and subnet as follows:
   - IP address: 192.168.0.99
   - Subnet: 255.255.255.0
4. Open the Video Manager application from the laptop by double-clicking the MobileView icon (shown below).



5. If the DVS Connections dialog box does not automatically open (Figure 35 on page 44), click OPEN to display the available connections.
6. Find the DVR listing in the the Machine column.
7. If the machine does not populate as expected, you can manually populate the machine ID.

   Click Direct IP Connection, and then click DVR Service IP Address in the Direct IP Connection dialog box. The field automatically populates with the IP address. Click OK, and then Yes at the prompt.
8. On the row with the correct machine listing, check Live, and then click OK.
9. Enter the logon name and password at the prompt. The software connects to the DVR and displays available live video.

Figure 35: DVS Connections dialog box



Remote desktop connection

Certain configuration functions must be performed on the PENTA DVR itself. The most effective means of accomplishing this is through remote desktop connection.

To establish a remote desktop connection:

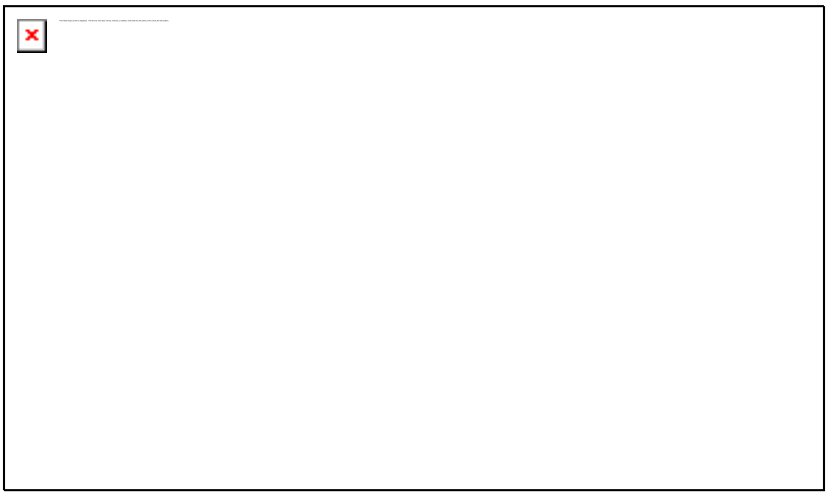
1. Connect an Ethernet crossover cable between your laptop Ethernet port and the DVR front Ethernet port. (A regular patch cable does not work.)
2. On the laptop, click Start > Settings > Network Connections.
3. Set the laptop's IP address and subnet as follows:
   - IP address: 192.168.0.99
   - Subnet: 255.255.255.0
4. Open a remote desktop connection by clicking Start > Programs > Accessories > Communications > Remote desktop connection.

   Alternatively, you can also click Start > Run and type `mstsc.exe` in the run box.
5. Enter the DVR's IP address (the default is 192.168.0.100) into the Remote Desktop Connection window (Figure 36 on page 45) and click Connect.
6. Enter the DVR credential information.
   - Default logon: administrator
   - Default password: ******** (case sensitive)

   Note: Contact your system administrator to obtain the password.

Once the DVR displays its desktop, you can operate as if you are directly connected to the DVR.

Figure 36: Remote Desktop Connection window



To log off from a remote desktop connection session:

1. Close all windows on the remote desktop.
2. Click on the remote desktop to ensure that it has focus.
3. Press Alt + F4 to display the Shut Down Windows dialog box.
4. Select Log Off from the menu, and then click OK.

Local resources

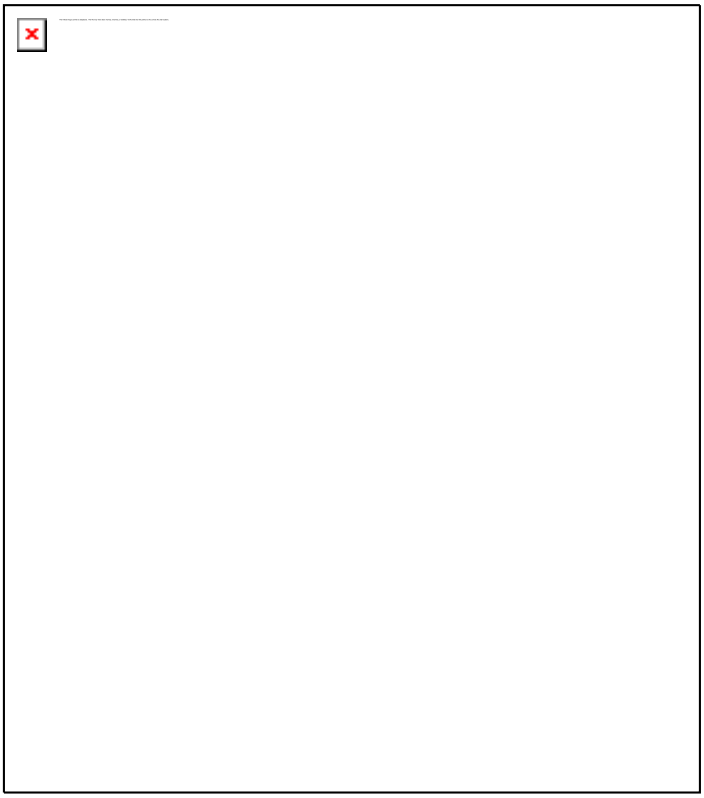
By default, the Remote Desktop Connection program uses resource mapping to make certain system resources available between the connected computers. Shared resources include sound, peripheral communication ports, printers, mass storage drives, and other plug-and-play devices. The MobileView DVR does not function properly when its local resources are remapped.

To turn off remote desktop resource mapping:

1. Start the remote desktop program.
2. Click Options to expand the Remote Desktop window.
3. Click the Local Resources tab.
4. In the “Remote computer sound” box, select Leave at remote computer.

5. In the “Apply Windows key combinations” box, select In full screen mode only.
6. Check Clipboard under Local devices and resources.
7. Click More.
8. Make sure all boxes and options are cleared.
9. Click OK.

Figure 37: Remote desktop connection - Local Resources tab



Date and time settings

Time and date parameters must be set on the DVR to correctly capture time-stamped images. These parameters include configuring the time zone, automatic adjustment for daylight saving time, and identification of a network timeserver for systems without a GPS antenna installed.

Note: Timeserver settings require a wireless connection to a network time protocol (NTP) server from the DVR network. Please consult the network administrator for information on accessing the NTP server

Caution: Failing to properly adjust system time may cause time-based searches to fail or result in partial or complete data loss.

To adjust your system time:

1. Establish a remote connection.

   See “Remote desktop connection” on page 44.

2. Double-click the system clock in the taskbar (shown below).

   The Date and Time Properties dialog screen opens.

3. Select the Date & Time tab and adjust settings to local time.
4. Select the Time Zone tab and adjust settings to the correct time zone.
5. Apply the daylight saving time adjustment, if applicable.
6. Select the Internet Time tab and adjust time server settings. This step is optional.
7. Click Apply.
8. Since these changes are being made to write-protected drive C, be sure to commit the changes and reboot the DVR. See “Committing DVR changes” below.

Committing DVR changes

The C drive on the DVR is write-protected. Any changes to the OS or registry, such as setting the time zone or loading an application upgrade, require completion of a special write operation to update the read-only image. The DVR provides this function using an onboard “commit” utility.

To permanently write changes to the C drive:

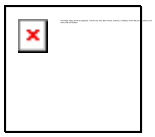
1. Establish a remote desktop connection.

   See “Remote desktop connection” on page 44 for more information.

2. Make changes to the system as required.

   Examples of changes could be time settings or IP addresses.

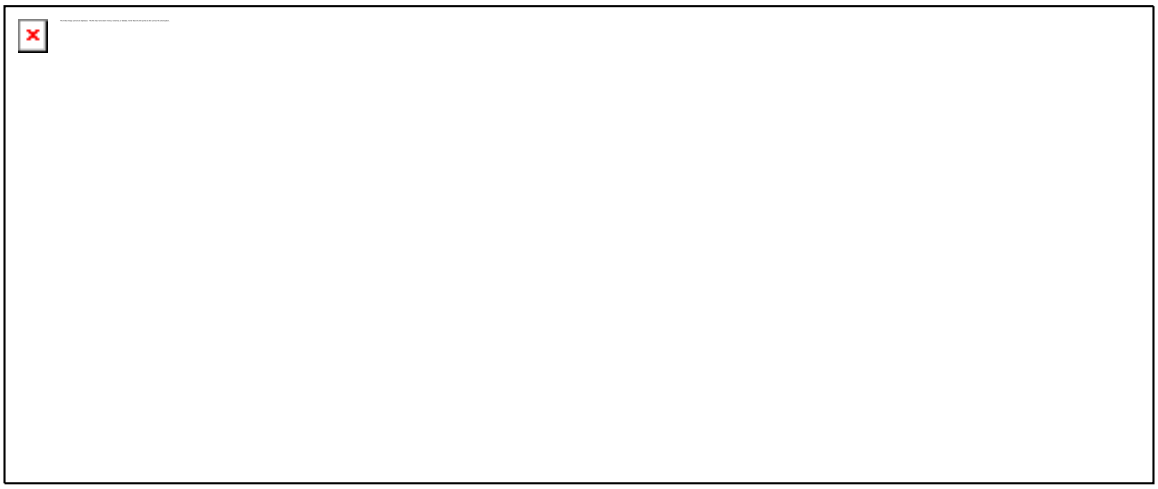
3. When finished, double-click the Commit shortcut on the desktop to launch the Commit application (Figure 38 below).



4. Press any key to close the Commit application window.
5. Perform an orderly shutdown to finalize a commit:
   a. Close all windows on the remote desktop.
   b. Click on the remote desktop to ensure that it has focus.
   c. Press Alt + F4 to display the Shut Down Windows dialog box.
   d. Select restart from the menu, and then click OK.

   The remote desktop session closes. The changes take effect upon restart.

Figure 38: Commit command window



System configuration

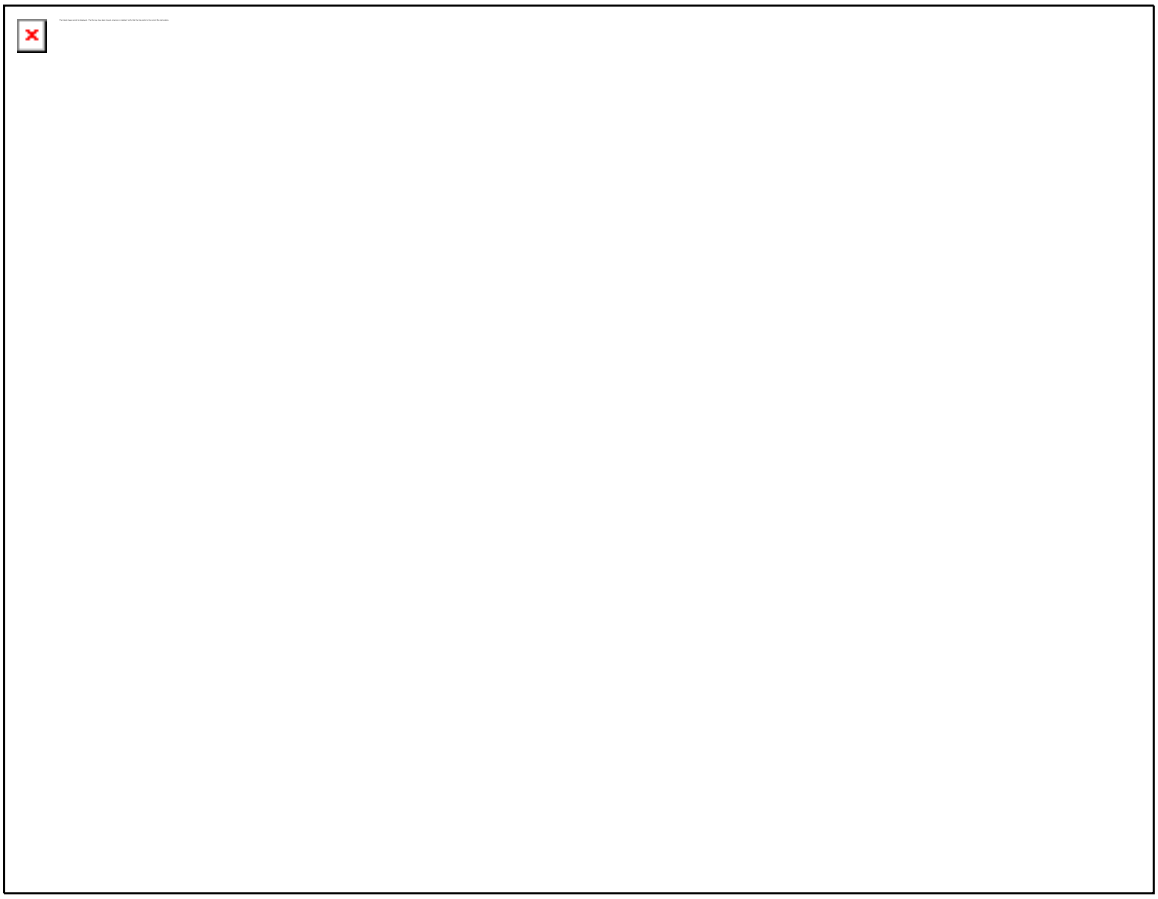
Each MobileView PENTA DVR must be configured based on system installation and usage requirements. Configurations therefore vary from install to install and site to site. If commissioning a new system, carefully consider how a particular property uses the MobileView system and adjust operating parameters accordingly.

To open the DVR's System Configuration window:

1. Connect to the target DVR as explained in “Connecting to the DVR” on page 43.
2. When connected, press the CONFIG button.

The System Configuration dialog box displays (see Figure 39 below).

Figure 39: System Configuration dialog box



The System Configuration dialog box displays a series of pages in the right pane. These are similar to the tabbed pages displayed in other dialog boxes, but are opened and closed using command buttons described below. The buttons open these pages:

- **Vehicle Setup.** Defines general properties of the DVR within the vehicle.
- **Camera Setup.** Defines the video recording settings for each individual camera.
- **Audio Setup.** Defines the audio recording settings.
- **Alarm Events.** Defines output reactions based on input activation.

- **I/O Devices.** Defines the generic input and out identification.
- **System.** Defines low-level operating characteristics of the DVR.

Note: The subsequent sections provide limited information necessary to accommodate initial DVR setup. For more information on functions and options, see the *MobileView Video Manager User Manual*.

Vehicle setup

To configure a vehicle:

1. Click Vehicle Setup in the System Configuration dialog box (Figure 40 on page 51) to open the Vehicle Setup page (Figure 40 on page 51).
2. Enter your depot ID and the corresponding vehicle ID.

   The depot ID typically represents the description of the property to which the vehicle is assigned. If installed, this text entry should match the depot ID stored in the Fleet Manager System.

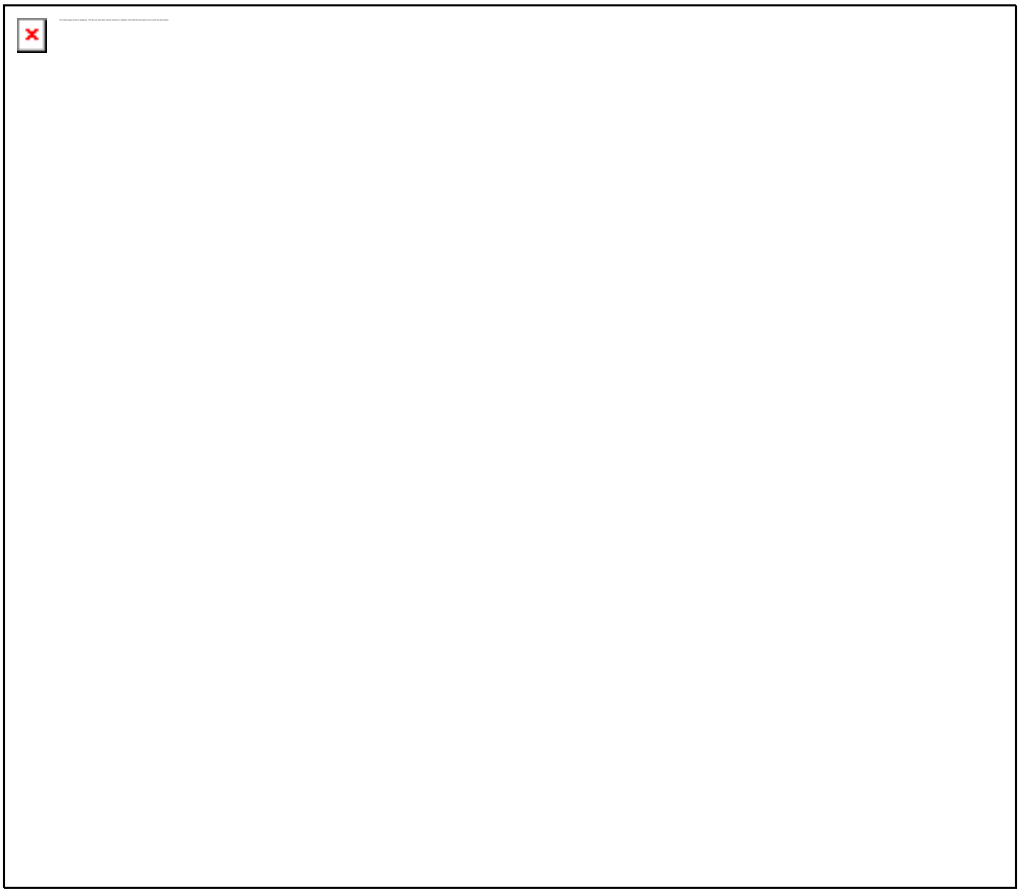
   The vehicle ID is the actual machine name of the DVR as seen in the MobileView network and must be unique.
3. Designate the DVR tracking mode.

   Select Mobile recorder if the system has GPS information. Systems with no current or future need for GPS should select None.
4. Ensure the Display Disk Full as Fault check box is clear.

   This ensures routine file deletions and maintenance do not activate a system fault.
5. Ensure that the Display future recording time warning box is checked.

   This ensures a system fault is activated if the latest stored surveillance data is more than 5 minutes ahead of the current DVR time.
6. Click Apply to save the new settings.

Figure 40: Vehicle setup page



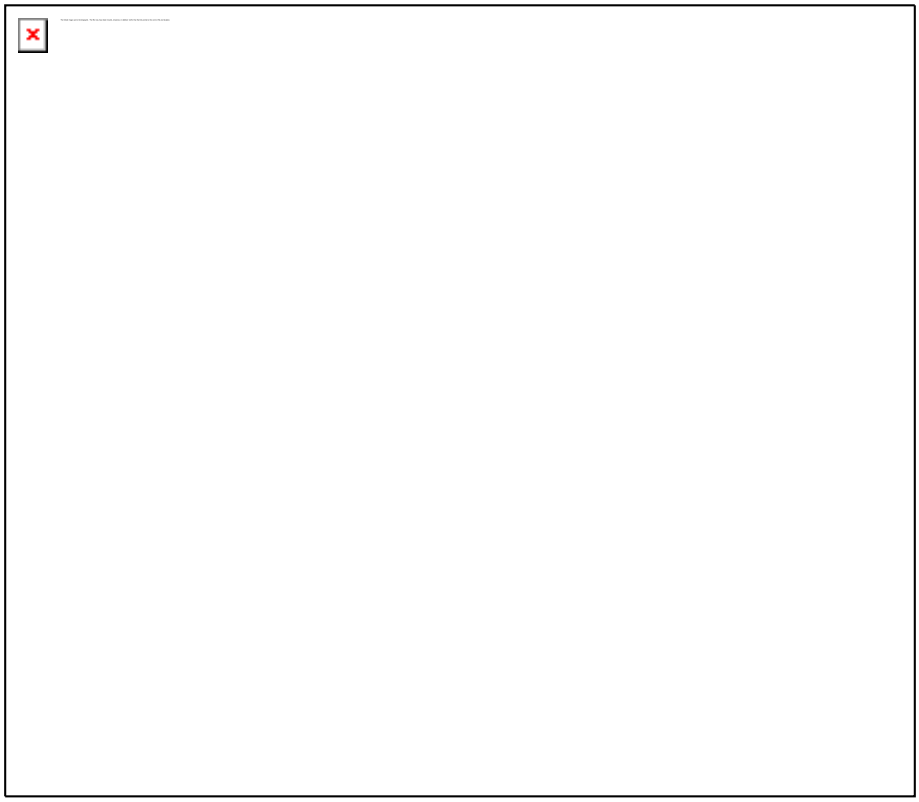
Camera setup

Click Camera Setup in the System Configuration dialog box to open the Camera Setup page (Figure 7). The Camera Setup page defaults to the general camera options. To access other options, click the appropriate button.

- **General.** Defines camera names, picture resolution, color depth, and frame rates.
- **Compression.** Defines compression parameters.
- **Security.** Defines embedded security content for captured video.
- **Camera control.** Allows fine adjustments to capture images.

Option settings are applied to individual cameras. If you want to apply the same settings to all cameras, click Apply Settings to All Cameras.

Figure 41: Camera Setup page



General camera options

To configure general camera options:

1. Click General on the Camera Setup page to display the general options (Figure 41 above).
2. Click a camera tile from those presented along the top of the window to select the camera to configure.
3. Check the Record images box to record the selected camera.
4. Enter a camera name and abbreviation for the selected camera.
5. Set the frame capture rate for the selected camera.
6. Set the picture resolution to the desired value.

   Refer to Table 7 on page 53 for supported resolution sizes. Higher resolution results in larger video file sizes and better image quality. Lower resolution results in smaller video size and reduced image quality.
7. Set the color depth to the desired value.
8. For the PENTA DVR, ignore the distance and bearing parameters

9. Select Apply to save the new settings.
10. Repeat all steps for each camera

Table 7: Supported camera resolutions

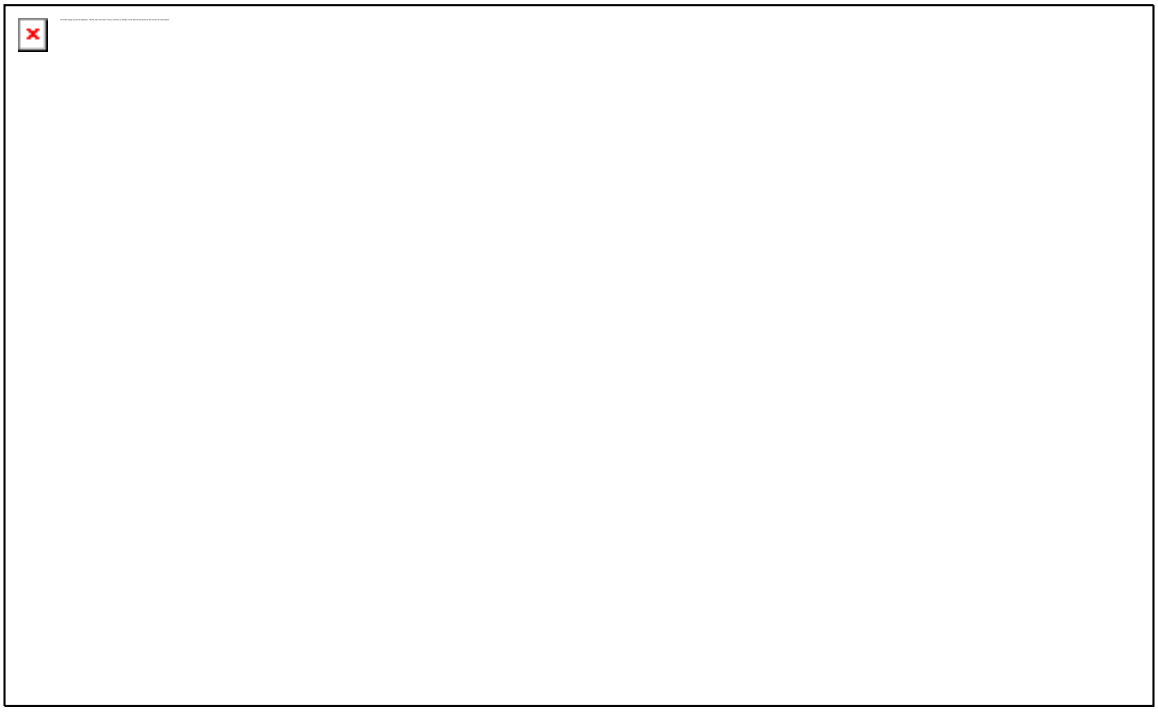
Resolution	NTSC
Low	352 x 240 (Quarter D1)
Medium	704 x 240 (Half D1)
High	704 x 480 (D1)

Compression camera options

To configure image compression options:

1. Click Compression on the Camera Setup page to display compression options (Figure 42 on page 54).
2. Click a camera tile from those presented along the top of the window to select the camera to configure.
3. Move the compression slider left (lower) or right (higher) to achieve the desired compression level. Lower compression results in larger video file sizes and better image quality. Higher compression results in smaller video size and reduced image quality.
4. Click Reset Compression to restore the system default value
5. Click Apply Settings to All Cameras to copy the current settings to all system cameras.
6. Click Apply to save the new settings.

Figure 42: Camera Setup - Compression options



Security camera options

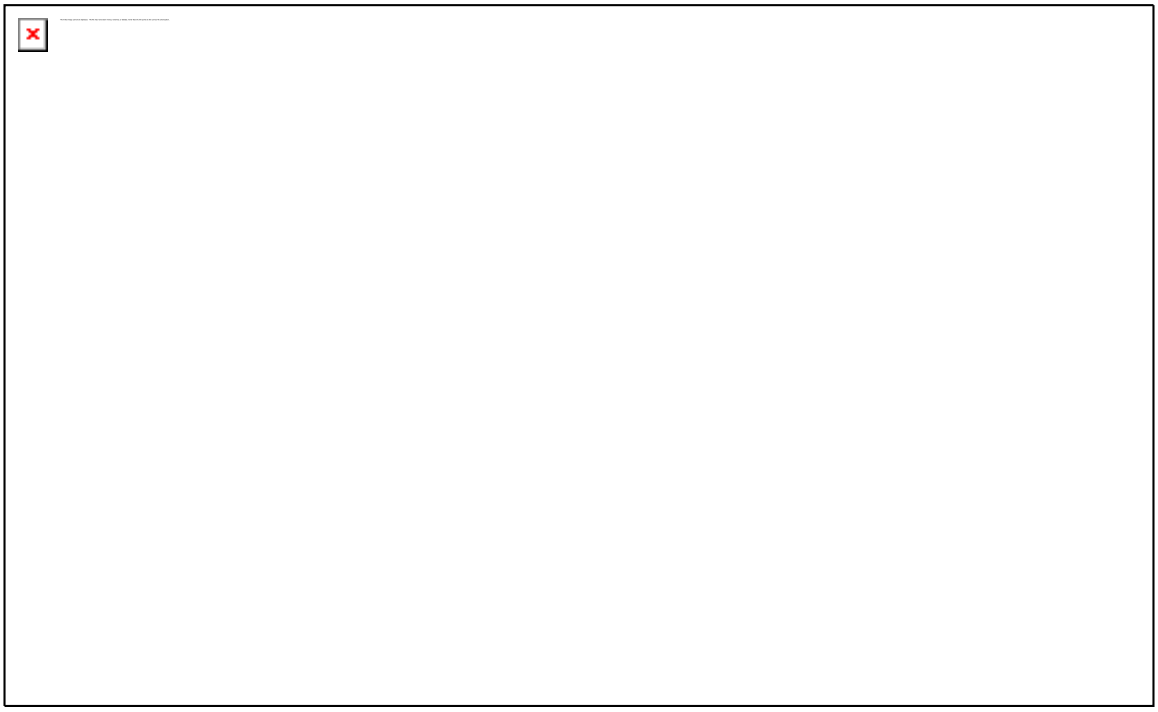
To configure camera security options:

1. Click Security on the Camera Setup page to display the security options (Figure 43 on page 55).
2. Click a camera tile from those presented along the top of the window to select the camera to configure.
3. Ensure the “Restrict local viewing only” check box is clear.

   If the box is checked, Video Manager running from a remote computer will be unable to view video from the selected camera.
4. Ensure that all options under Image authentication are checked.

   If these boxes are not checked, Video Manager may display incorrect machine information during playback of archived video.
5. Click Apply Settings to All Cameras to copy the current settings to all system cameras.
6. Click Apply to save the new settings.

Figure 43: Image security options

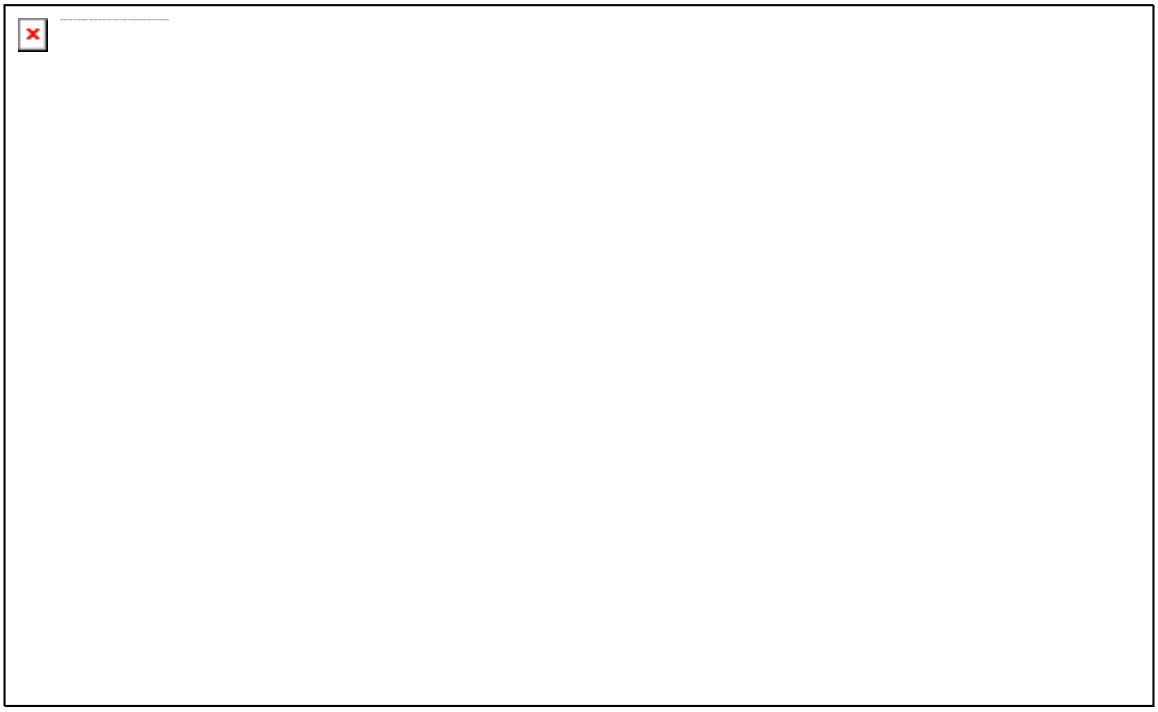


Camera control options

To configure camera control options:

1. Click Camera Control on the Camera Setup page to display the camera control options (Figure 44 on page 56).
2. Click a camera tile from those presented along the top of the window to select the camera to configure.
3. Move the image control sliders left (lower) or right (higher) to achieve the desired video compensation levels. These changes have little discernable effect on video file sizes.
4. Click the Reset Settings button to restore the system default values.
5. Click Apply Settings to All Cameras to copy the current settings to all system cameras.
6. Click Apply to save the new settings.

Figure 44: Camera Setup - Camera Control options



Audio setup

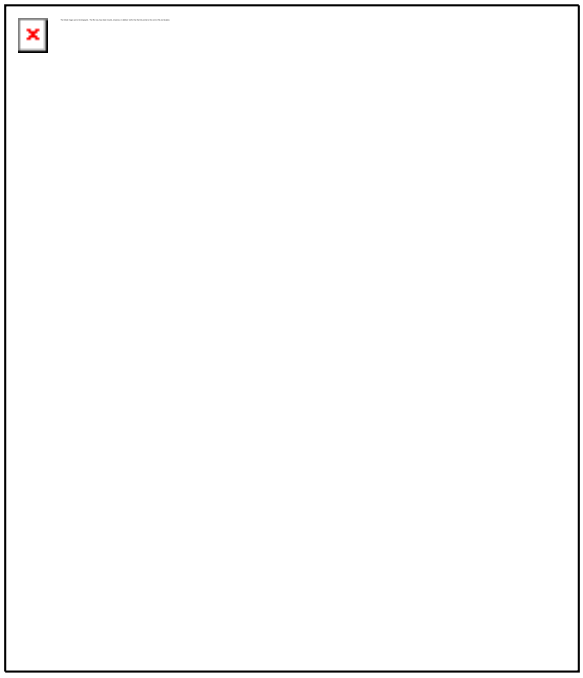
To configure the audio options:

1. Click Audio Setup in the System Configuration dialog box to display the audio options (Figure 45 on page 57).
2. To record audio on the vehicle, check the Record audio check box. If this check box is clear, routine audio is not recorded.

   Note: Changing this selection reinitializes the data acquisition system and purges all stored audio and video data.
3. Ensure that the “Local audio play only” check box is clear.

   If the box is checked, Video Manager running from a remote computer will be unable to playback audio from the recorder.
4. Edit the audio channel names to match the installation.
5. Click Apply to save the new settings.

Figure 45: Audio Setup page



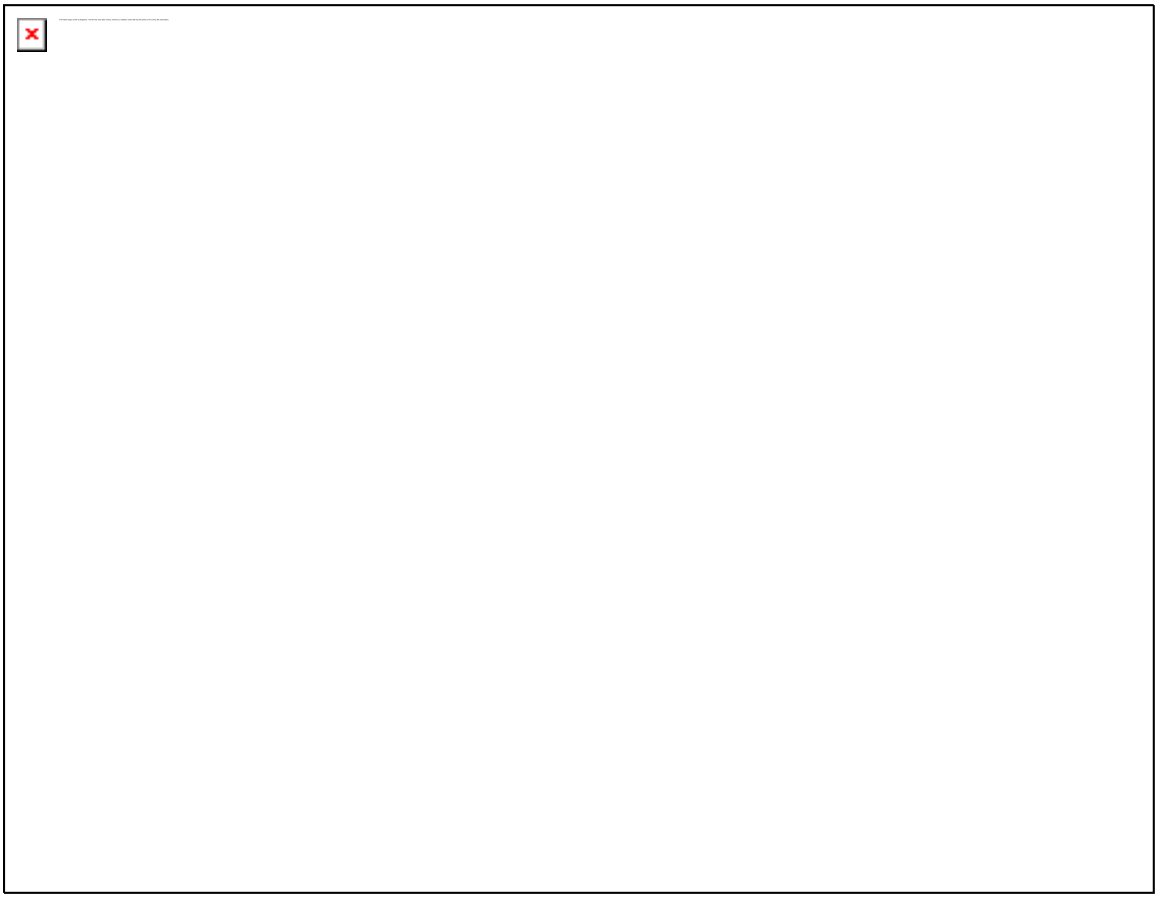
Alarm events

Click Alarm Events in the System Configuration dialog box to display the Alarm Events page (Figure 46 on page 58). The Alarm Events page is broken into five main sections:

- **Event List.** Lists all events programmed in the DVR.
- **Event Settings.** Defines basic event configuration settings.
- **Event Activation.** Defines the input and state required to activate the event.
- **Activation Schedule.** Defines a schedule when the event is active.
- **Event Reaction.** Defines reactions that occur when the event activates.

Aside from recording video, events are the most useful function of the DVR.

Figure 46: Alarm Events page



To configure an alarm event:

1. Open the Alarm Events page.
2. Click Add New Event and enter the event name in the Description field.
3. Leave the Code field blank and enter values (in seconds) in the Mask time and Hold time fields.

   Mask time refers the amount of time any actions associated with the alarm event are masked. Hold time refers to the amount of time an alarm event is halted.
4. Define the input that activates the event from the available options in the Event Activation section. You can only specify one activation input per event.
5. If using time-based activation, define a schedule in the Activation Schedule section.
6. Define the output reactions that occur when the event is active. Multiple output reactions can be assigned to a single event.

7. Click Apply to save the new settings.

“Shut down immediately event” reaction

The “Shut down (turn off) the system immediately” event reaction initiates an immediate emergency shutdown of the DVR within 10 seconds of event activation. This event reaction is specifically intended for use with Delay off wiring configurations discussed in **Error! Reference source not found.** “DVR installation” **Error! Bookmark not defined.**. In Figure 21 and Figure 22 on page 27, digital input 7 has been designated as the event activation trigger and “Shut down immediately” is the event reaction.

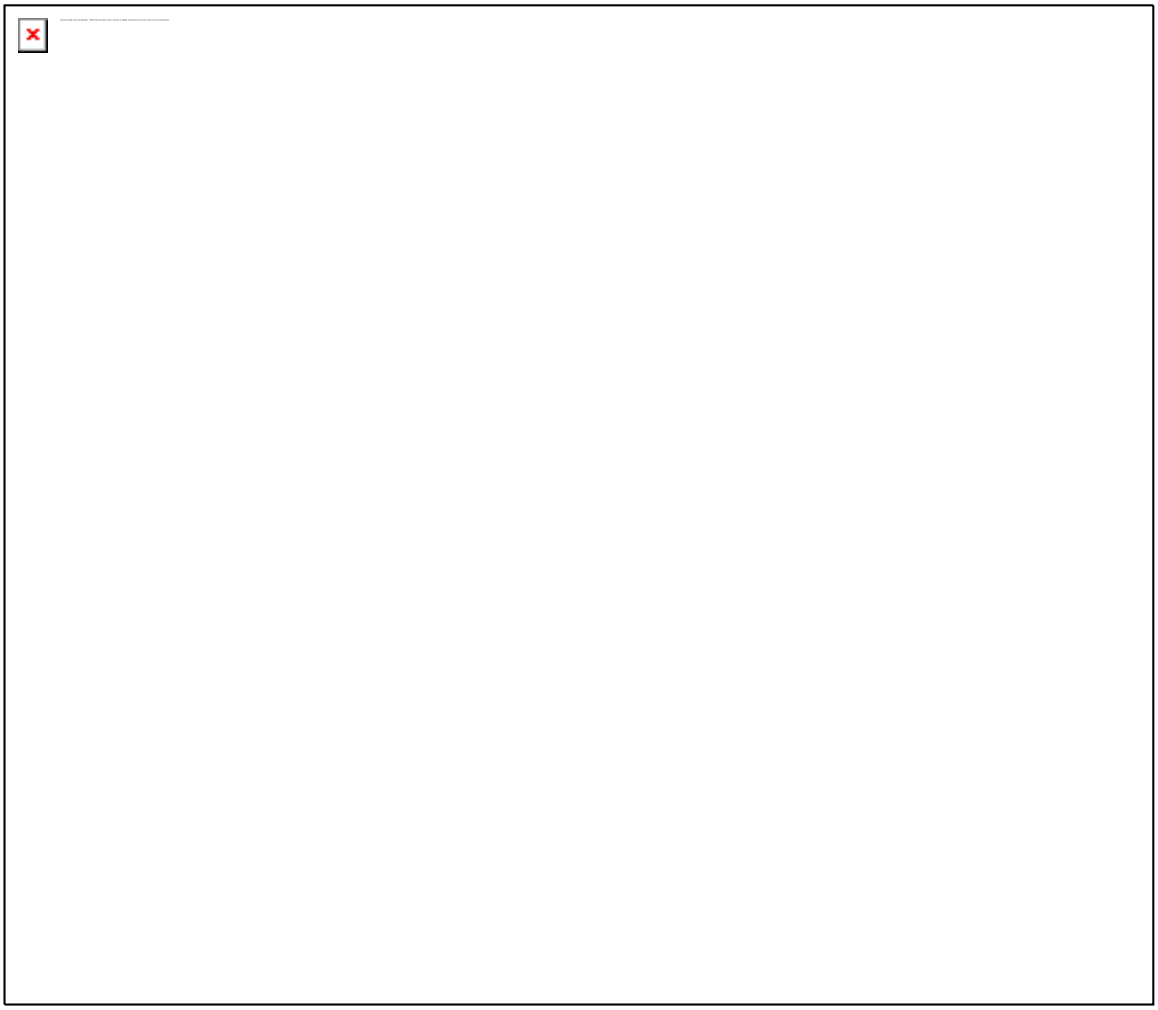
I/O devices

Click I/O Devices in the System Configuration dialog box to open the I/O Devices page (Figure 47 on page 60). The I/O Devices page is divided into three main sections:

- **I/O naming.** Defines a plain English name for each input and output.
- **MUX camera assignments.** Assigns camera channels to MUX outputs.
- **MUX settings.** Defines general multiplexer operating parameters.

Since I/O names are referenced in other menus screens, a descriptive name is needed.

Figure 47: I/O Devices page



To configure I/O devices:

1. Open the I/O Devices page.
2. Click each input, output, and MUX channel and edit the entry.
3. Select which cameras display on each MUX output under the “Multiplexer camera selection” section.

   Note: PENTA only supports MUX channel 1. Setting cameras to other MUX channels will have no effect.
4. Set the cycle dwell time for each MUX channel under the Multiplexer Settings section.

   Cycle dwell time refers to the amount of time each assigned camera is displayed on the MUX output.
5. Click Apply to save the new settings.

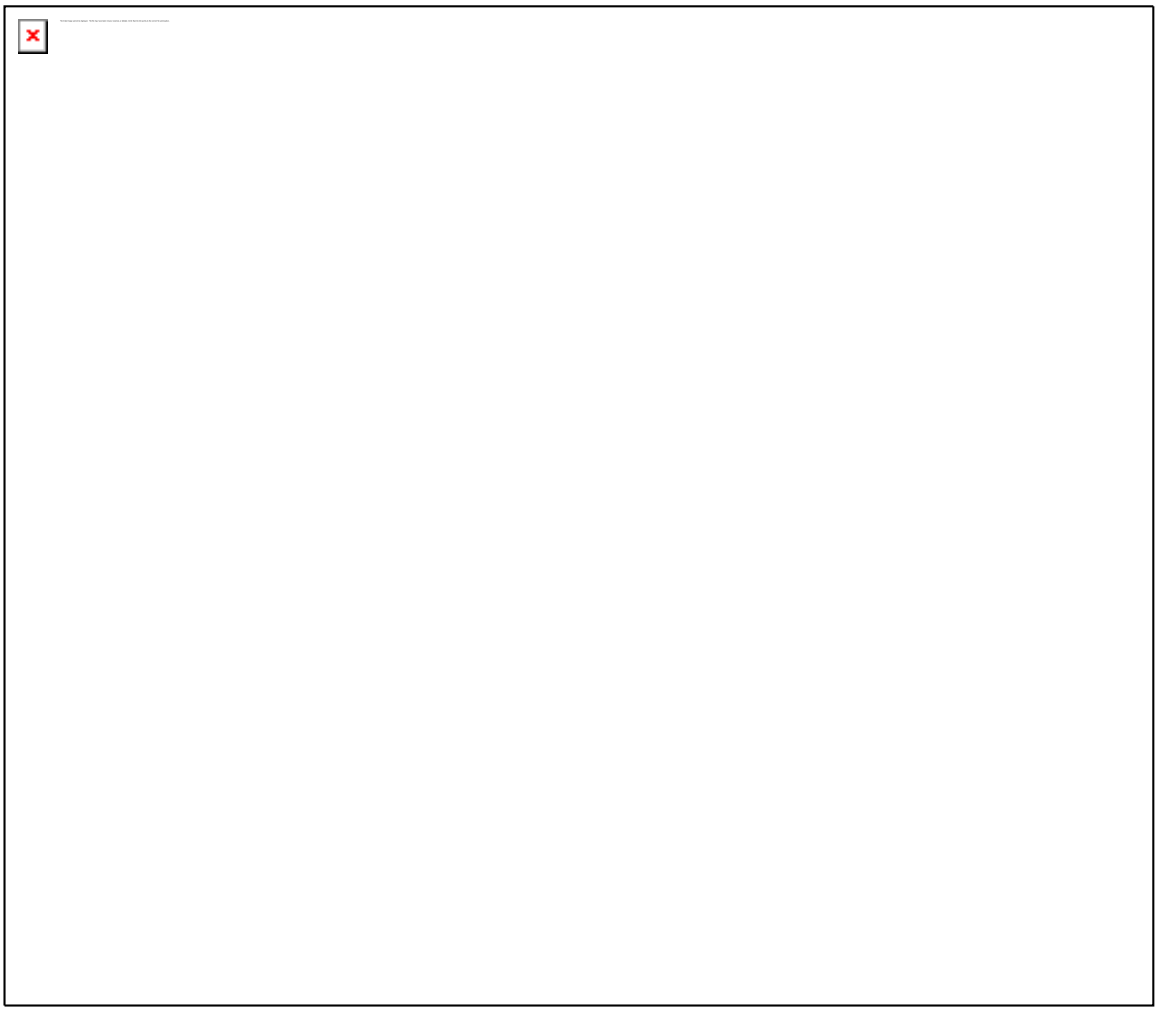
System options

Click System in the System Configuration dialog box to display the System page (Figure 48 below). The System page is divided into four main sections:

- **Storage allocation.** Defines storage allowances within the surveillance file.
- **System settings.** Defines the ignition off delayed shutdown time for the DVR.
- **Camera settings.** Defines the system camera count and reaction to ignition off and video restoral.
- **Archive settings.** Defines parameters for automatically purging archive files.

Options in this section affect how the DVR operates at a low-level. Exercise caution when modifying any of these parameters or undesired operation may occur.

Figure 48: System page



To configure system options:

1. Open the System page.
2. Define the storage parameters in the Storage Allocation and Usage section. See “Storage allocation and usage” below for more information.

   Caution: Once set, the values in Table 8 on page 63 should not be changed. Modifying these settings will reinitialize the data acquisition system and purge all stored audio and video data.
3. Define the parameters related to system cameras in the System Settings section.

   Set the Shutdown dwell time. This is the amount of time the DVR delays shutdown after the vehicle ignition has been turned off.
4. Define parameters related to system cameras in the Camera Settings section.

   Set the number of cameras installed on the system. When the number of video inputs drops below this number, the DVR activates a system fault.

   Set the camera restart dwell time. When a video signal is lost, the system checks for the return of that signal at the specified interval. The minimum setting is 10 seconds.

   Set the camera shutdown dwell time. This is amount of time the DVR will continue recording after the vehicle ignition has been turned off. This setting should be less than or equal to the system shutdown dwell time.

   Note: The camera shutdown dwell time does not override the system shutdown dwell time.
5. Define the archive and log file purge days under the Archive and Log Storage section
   - **Archive file retention.** Defines how long video archive files remain on the DVR before being automatically purged. The default value is 30 days.
   - **Log file retention.** Defines how long log and discrete image files remain on the DVR before being automatically purged. The default value is 90 days.
6. Click Apply to save the new settings.

Storage allocation and usage

Storage allocation and usage options specify how much of the available storage should be set aside for video, sound, GPS, and alarm/event storage. These are set by the installer and should not be changed. Any change to these values reinitializes (deletes) the primary data store on the DVR.

The MobileView PENTA DVR is configured by the installation contractor for correct operation and space allocation. Do not change these options.

Caution: Storage allocation and usage options control the structure of the recorder's data file. Options cannot be changed without erasing and recreating the data file, which results in permanent loss of all existing recorded data. Only experienced operators should change storage allocation and usage.

The system data file stores all video, audio, GPS, and other recorded information, as well as site details. The following rules apply to the creation and management of the system data file:

- The system data file is a single file containing all recorded parameters, indexes, and other necessary structures.
- Only experienced operators should manage the system data file.
- Changing the structure of the data file once it has been created results in the loss of all stored video data.
- Sufficient space must be allocated for all parameters that are to be recorded (video, sound, GPS).

Table 8: Storage allocation and usage options

Option	Description
Total space available	The total amount of disk space available on the drive where the data file resides. This should be the full size of the storage drive.
Space to allocate	The amount of disk space to allocate on the storage drive for the system data file expressed as a percentage of the total space available. As the storage drive should not be used for any other storage purpose, this setting should always be set to 100% for normal operation.
Video data	The amount of storage space within the system data file to allocate to the storage of video data expressed as a percentage of the whole data file size. As video pictures are generally the most storage intensive of the recorded parameters, most space should be allocated to the storage of video data. Default value is 94%.
Sound data	The amount of storage space within the system data file to allocate to the storage of sound data expressed as a percentage of the whole data file size. Space for sound recording is only required if sound recording has been enabled or if it is intended that sound recording may be required at some later time. Default value is 5%.
GPS data	The amount of storage space within the system data file to allocate to the storage of recorder or site positions (GPS locations from a mobile recorder) and expressed as a percentage of the whole data file size. As site locations or GPS data have minimal space requirements, the percentage allocated to this can be small. Default value is 1%.

Option	Description
System/alarm events	The amount of storage space within the system data file to allocate to the storage of alarm system event logs. As the event log requires a comparatively small amount of storage space, the percentage allocated to this can be minimal. Default value is 0%.

Enter storage allocation parameters as a percentage value. The equivalent storage capacity in gigabytes is calculated by the system and displayed besides the entered percentage value.

The space allocation you enter must total 100%. The system automatically adjusts percentage allocation values to ensure 100% allocation is maintained.

Deleting files after setup

Once DVR configuration and testing is complete, you must delete archived surveillance, video events, and log files created during installation and testing. These files may have data with incompatible time codes, out-of-sequence cameras, and bad naming conventions that can affect system performance. In certain circumstances, failure to perform these deletions may result in loss of video data. Deleting these files ensures that final configurations work properly.

Before starting, it is helpful to understand the DVR's drive architecture:

- C drive: Contains the Windows OS (write protected)
- D drive: Contains DVR configuration and history files such as:

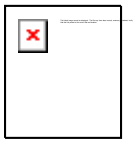
  Outgoing directory (files for transfer to Fleet Manager server)
  Workspace directory (setup and configuration files)
- E drive: Video event files and current log file
- F drive: Current surveillance file (CAMDATA.DVS)

Follow the steps in "Stopping the DVS server," "Deleting files," and "Restarting the DVS server" below to properly delete files.

Stopping the DVS server

To stop the DVS server:

1. Connect to the DVR desktop. See "Remote desktop connection" on page 44.
2. Double-click the services shortcut on the desktop (shown below).



3. Navigate to the service named DVS server and double-click the service name.
4. Select Stop to stop the service.

Deleting files

To delete files:

1. In Windows Explorer, navigate to the outgoing folder on drive D.
2. Delete all files and folders in the drive D outgoing folder.

   Note: Do not delete the outgoing folder itself.
3. Navigate to drives E and F and delete all files and directories.

Restarting the DVS server

After completing the steps in “Deleting files” above, restart the DVS server.

To restart the DVS server:

1. Reopen the Services control panel.
2. Double-click the DVS_Server service.
3. Select Start to start the service.

   The system recreates new versions of the deleted files compliant with current system settings.
4. When finished, log off using the Alt+F4 procedure explained in “Remote desktop connection” on page 44.

Chapter 5
Optional hardware installation

Summary

This chapter describes how to install optoinal hardware components such as the accelerometer, impact sensor, panic button, microphone, and GPS unit.

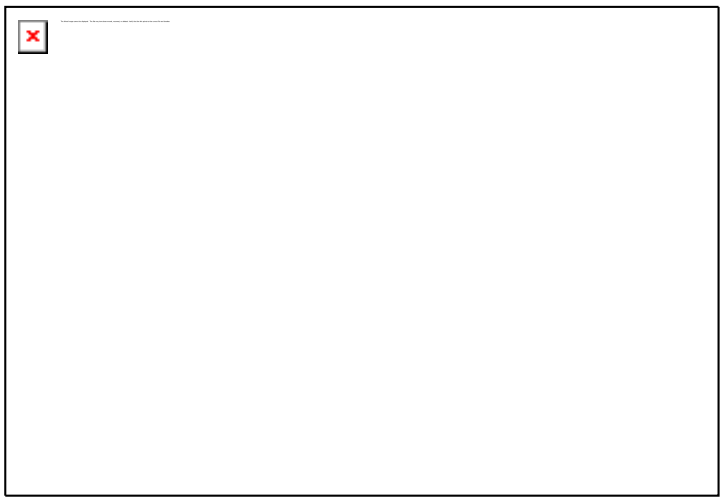
Content

Installing the accelerometer

You must configure the accelerometer before mounting the device. Once the accelerometer has been mounted, you can no longer configure the device. See “Configuring the accelerometer” on page 69 for more information.

Mount the accelerometer on a flat, stable surface. The selected location should not be subject to vibration exceeding that experienced by the vehicle chassis. A frame mount or reference location is preferred. Failure to consider location variables may contribute to erroneous activations. Ensure that the mounting location is not subject to exposure to liquids during vehicle cleaning. Damage or corrosion of components may result if unit is sprayed down with water or other cleaning liquids.

Figure 49: Accelerometer



1. This side faces the front of the vehicle.

To install the accelerometer:

1. Using the accelerometer as a template, mark the locations of the mounting holes.

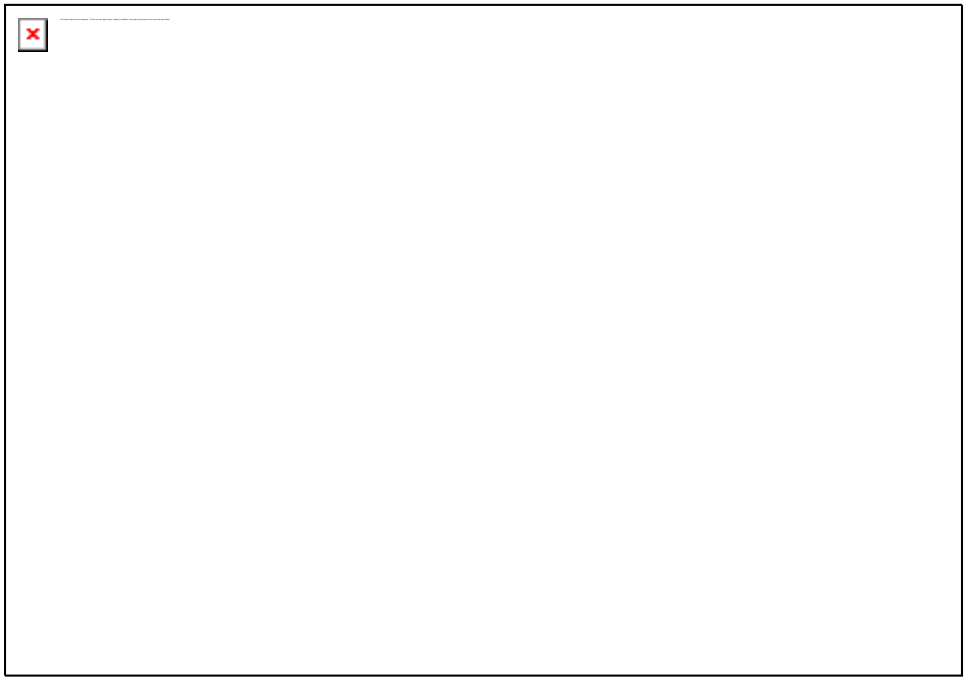
   Align the accelerometer so that it is square with the front and back of the vehicle and so the Y arrow points to the front of the vehicle as shown in Figure 49 above.
2. Drill the mounting holes.
3. Connect one end of the supplied serial cable to COMM3 on the DVR.
4. Route the other end of the serial cable to the mounting location for the accelerometer.

5. Configure the accelerometer (see “Configuring the accelerometer” below) and mount it.

Configuring the accelerometer

To open the accelerometer configuration utility:

1. Establish a remote desktop connection to the DVR. See “Remote desktop connection” on page 44.
2. Stop the DVS server. See “Stopping the DVS server” on page 64.
3. On the DVR desktop, double-click the shortcut labeled MobileView PENTA Hardware Monitor. The configuration software opens (shown below).



Caution: Ensure that the DVR is off when connecting or disconnecting the accelerometer device.

Synchronizing the accelerometer

Click Synchronize accelerometer to configure the accelerometer to the correct communication speed. A dialog box indicates that the accelerometer is being synchronized.

Calibrating the accelerometer

Before installation, the X, Y, and Z axes of the accelerometer are calibrated to the force of gravity to both a maximum and minimum.

To calibrate the accelerometer:

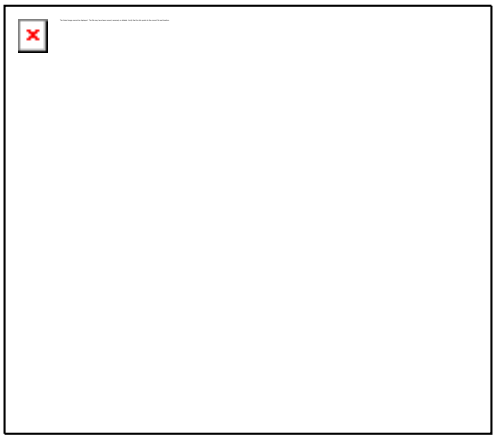
1. Click Calibrate Accelerometer.
2. Rotate the accelerometer on each axis to comply with calibration instructions. When it reaches max/min, click OK.

Viewing accelerometer data

After completing the calibration procedure, you can view the accelerometer data.

To view the data, click View Accelerometer. With the accelerometer on a flat surface, the minimum and maximum values shown for the Z axis should be near 1; and the minimum and maximum values for the X and Y axes should near 0, as shown in Figure 50 below.

Figure 50: Accelerometer data

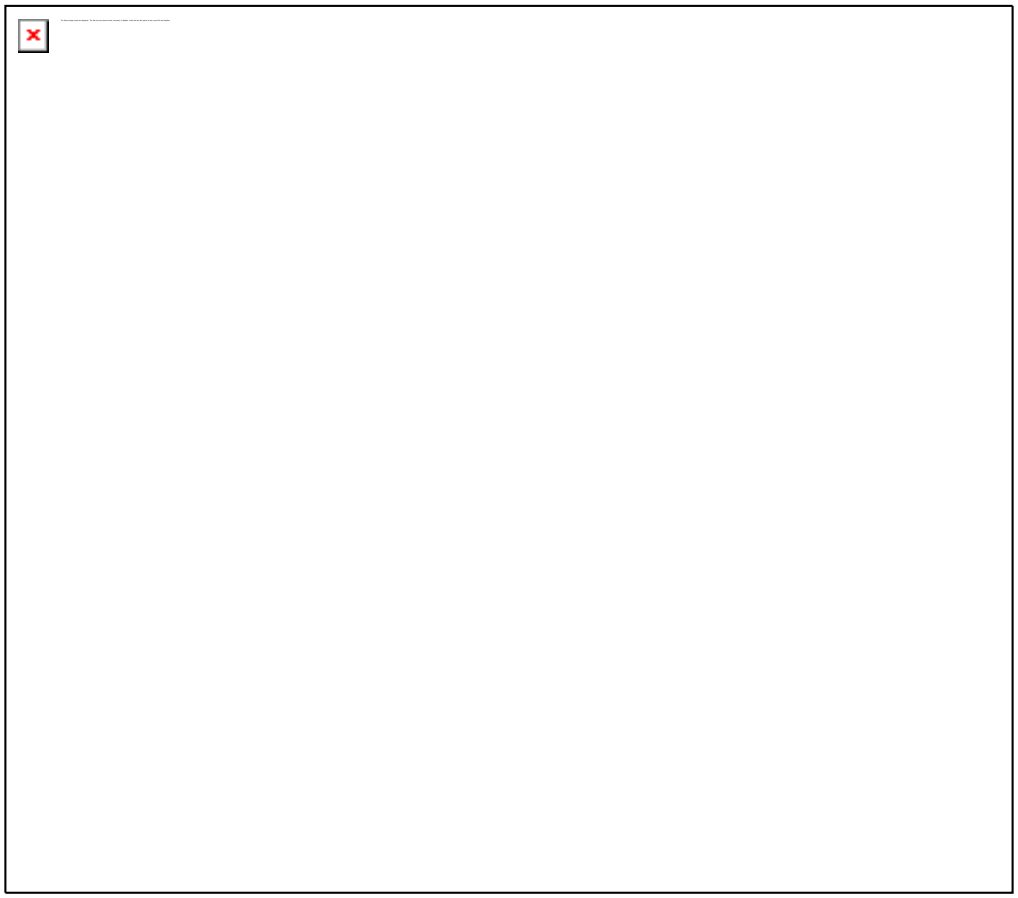


Configuring DVR accelerometer alarm events

Once the accelerometer is calibrated, you can close the MobileView PENTA Hardware Monitor program and configure the DVR to perform certain functions based on accelerometer activation readings using Video Manager. See the *MobileView Video Manager User Manual* for detailed information on accessing and configuring alarm events. The instructions in this manual refer only to accelerometer alarm event configuration.

Use the Alarm Events page (System Configuration > Alarm Events) in Video Manager to configure accelerometer alarm events. Figure 51 below shows a typical alarm event configuration for the accelerometer.

Figure 51: Typical accelerometer alarm event



To add an accelerometer alarm event:

1. In Video Manager, open the Alarm Events page.

   See “Alarm events” on page 57 for more information on displaying this page.

2. Click Add new event and enter a description such as Accelerometer.
3. Select the axis which must exceed the G value (entered next) to activate the event. If multiple axes are selected, any one that exceeds the value will activate the event.
4. Enter a set-point (in Gs).

   A typical set-point is between 3.0 and 4.0 G. A value of 3.0 G typically triggers an alarm event if the vehicle drives fairly roughly over a curb or pothole.

Configure an event reaction so that exceeding the set-point triggers an action, such as creating an archive. The example in Figure 51 on page 71 shows an event reaction that creates a two-minute video recording before the trigger and a three-minute video recording after the trigger event.

If the G-force set point is exceeded on any axis, the following entry is recorded in the log file:

```
EVENT: G-Force exceed [+X = 3.122000] [-X = 0.834000] [+Y
= 0.434000] [Y = 0.544000] [+Y = 0.122000] [+Y =
0.224000]
```

Enabling the accelerometer in the INI file

By default, the DVR INI file disables the accelerometer opreation. Enabling accelerometer operation requires that you change the INI file. Details on this change are outlined below.

Caution: Using extreme caution when editing system INI files. Unspecified changes may result in unexpected system behavior or data loss.

To enable accelerometer functionality:

1. Establish a remote desktop connection to the DVR.
2. Shut down the DVSS_Server.

   See “Stopping the DVS server” on page 64 for more information on shutting down the DVS server.
3. Open Windows Explorer and navigate to the D drive on the DVR.
4. Double-click the workspace directory.
5. Double-click the Workspace folder.
6. Open the FltSetting_GE.ini file and scroll to the following section:

   ```
   [AccelerometerSettings]
   AccelerometerType=none
   AccelerometerComPort=3
   AccelerometerBaudRate=57600
   ```
7. Change the AccelerometerType to seraccel:

   ```
   [AccelerometerSettings]
   AccelerometerType=seraccel
   AccelerometerComPort=3
   AccelerometerBaudRate=57600
   ```

8. Save and close the INI file.
9. Restart the DVS server and close the remote desktop connection. Accelerometer functionality is now enabled.

Installing an impact sensor

The MobileView PENTA allows you to connect an optional impact sensor to sense shock impacts greater than 4 G on the horizontal plane. Shock events from the impact sensor are typically monitored on digital input 2 using a special connection configuration that provides input to the DVR and power to the impact sensor. The sensor, which is typically mounted near the DVR enclosure, comes with a 7 ft. (2.1 m) cable that is designed to terminate at the DVR as explained below.

Caution: Failure to follow the instructions provided may result in damage to the DVR or the impact sensor. Do not install the impact sensor until you have tested its functionality on each vehicle. The impact sensor should be mounted on a flat, stable surface and secured to the frame of the vehicle. The mounting surface must not be subject to vibrations.

Impact sensor installation requires use of a 10 kΩ, 1/4 W resistor. To avoid possible shorts, ensure resistor leads are insulated with heat shrink (preferred) or electrical tape.

To install the impact sensor:

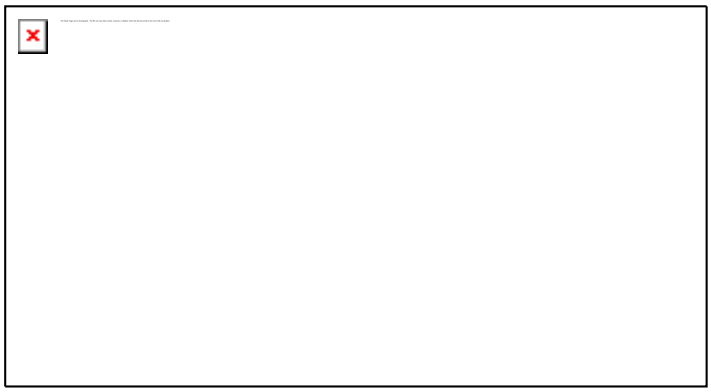
1. Using the impact sensor as a template, mark the location of the two mounting holes.

   The impact sensor should be aligned so that it is square with the front and rear of the vehicle (see Figure 52 on page 74).
2. Drill the mounting holes with an appropriate size drill bit.
3. Mount the impact sensor.
4. Route the provided cable to the DVR.

   If you need to extend the cable, splice a three-conductor 18 AWG cable to the impact sensor’s cable. The spliced wires must be soldered, and heat-shrink tubing must be used to insulate exposed wire. The maximum cable length is 25 ft. (7.6 m).
5. Connect the impact sensor cable to the J3 connector as follows (see Figure 53 on page 74):

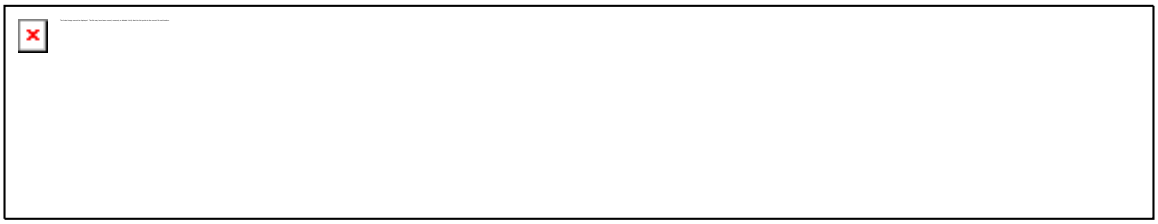
- Connect the red positive wire to 12VDC Out (J3, terminal 9).
- Connect the black common wire to Ground (J3, terminal 10).
- Connect the green or white input wire to Digital Input 2 (J3, terminal 2).
- Install a 10 kΩ, 1/4 W resistor between J3 terminal 2 and J3 terminal 9.

Figure 52: Aligning the impact sensor



1. Align square with the front and rear of the vehicle
2. Align square with the sides of the vehicle
3. Cable to DVR backbox

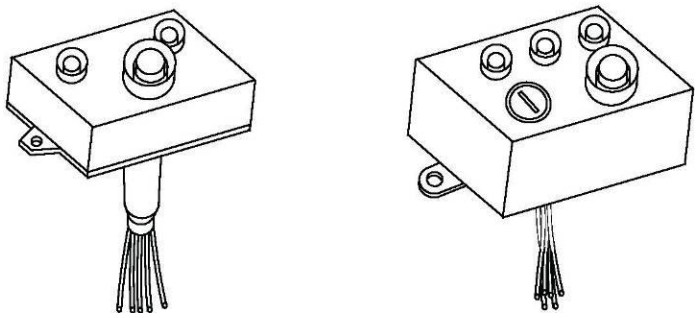
Figure 53: Impact sensor wiring



Installing a panic button

Panic buttons are optional and are typically installed near the driver. There are two models: one with a key reset and one without (Figure 54).

Figure 54: Panic buttons



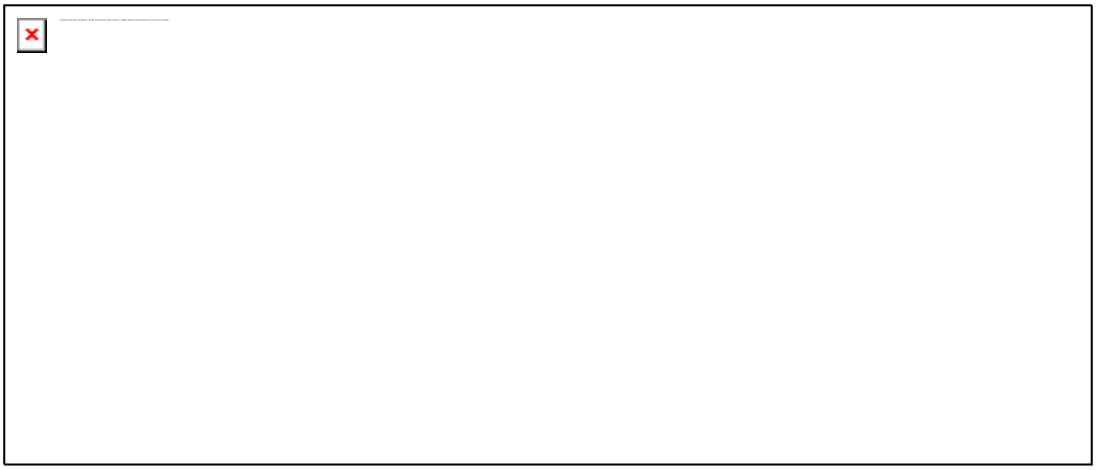
To install a panic button:

1. Mark the location of the mounting holes, using the panic button as a template.
2. Drill the mounting holes, using a 3/16 in. (5 mm) drill bit.
3. Drill a hole for the panic button wiring, using a 3/4 in. (20 mm) drill bit.
4. Splice a six-conductor 18 AWG cable to the panic button wiring by soldering the wires and applying heat-shrink tubing to the exposed wire.

   Note: The panic button with key reset has six wires, and the panic button without key reset has only five. The NC and common wires are both yellow and are interchangeable.
5. Route the cable to the DVR. See Figure 55 on page 76. Connect the cable to the connectors as follows:
   - Connect the yellow NC and common wires to Digital Input 1 (J3, terminal 1) and 12VDC Out (J3, terminal 9).
   - Connect the gray positive wire to 12VDC Out (J3, terminal 9) or any other available 12 V terminal.
   - Connect the green normal wire to Software LED output (J2, terminal 7).
   - Connect the red check wire to Camera LED output (J2, terminal 6).
   - Connect the white negative wire (present only on the panic button with key reset) to Ground (J3, terminal 10).

   Note: Digital Input 2 (J3, terminal 2) is typically reserved for the impact sensor input.
6. Mount the panic button, using the previously drilled holes.

Figure 55: Panic button wiring



Status LEDs

The MobileView PENTA provides LEDs for status indication. When the green LED is on and red LED is off, the system is functioning properly. When the red LED is on, it indicates the system needs service.

Installing a microphone

The DVR supports up to two optional microphones. One is typically mounted in the head sign area near the driver, and a second can be mounted toward the rear of the vehicle.

See the instructions provided with the microphones for installation procedures. Route a two-conductor, shielded twisted-pair cable for audio and a twisted-pair power cable (18 AWG wire is recommended) from the microphone device to the DVR location. The shield drain wire is attached at the microphone end only. Leave a service loop at the microphone end.

Figure 56 shows single-channel audio wiring for one microphone. Figure 57 shows dual-channel audio wiring for two microphones.

Figure 56: Single-channel audio wiring

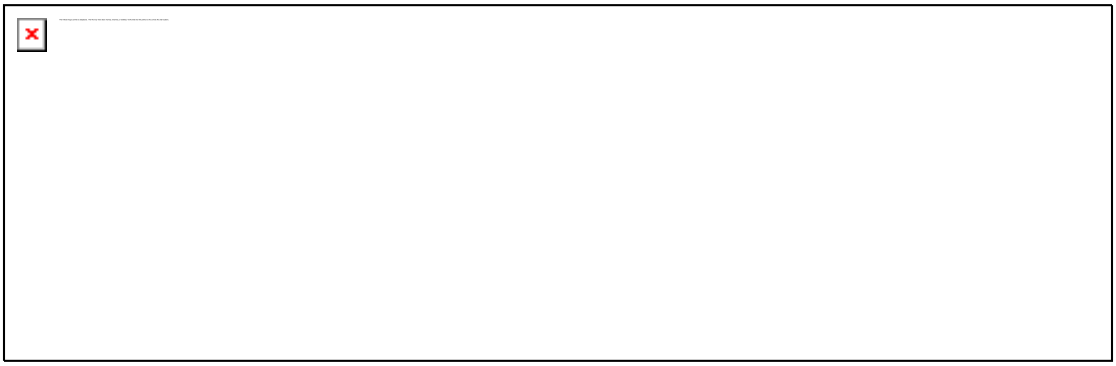
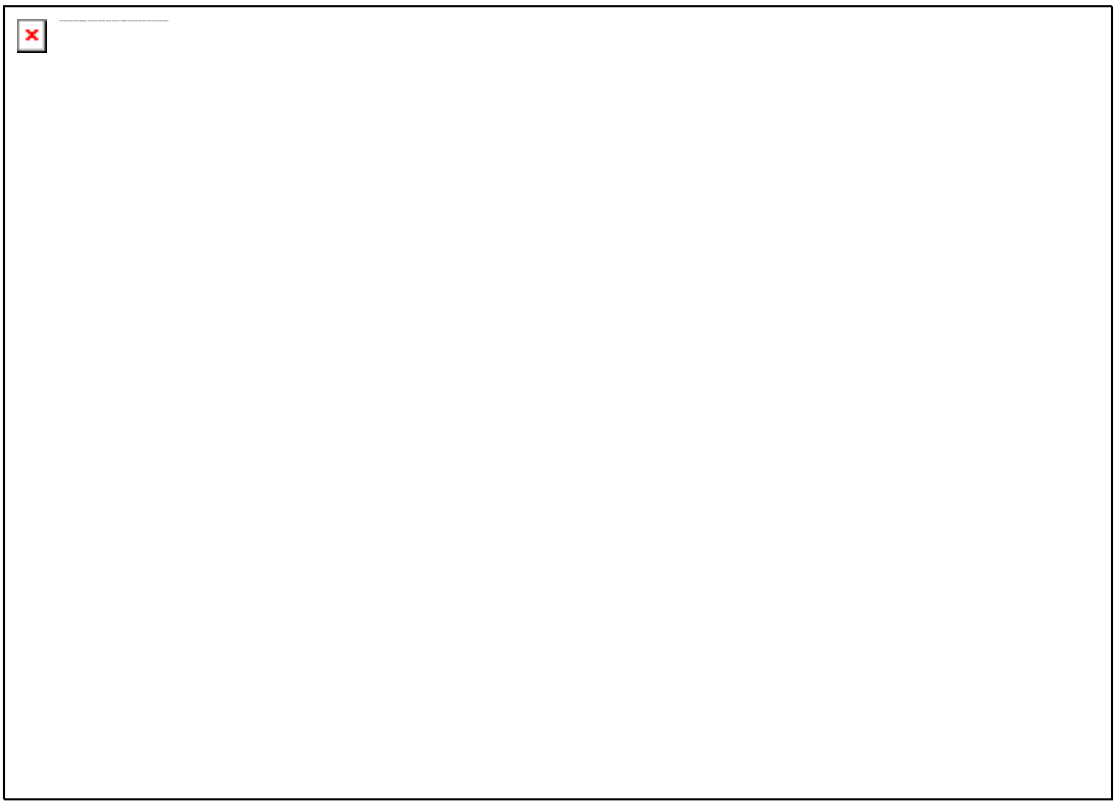


Figure 57: Dual-channel audio wiring



Note: For instructions on making wiring connections at the microphone, see the manufacturer's instructions.

Installing a GPS unit

The MobileView PENTA is equipped with GPS technology. A compatible GPS antenna is needed to activate the feature. The GPS antenna connects to the DVR GPS connector (Figure 16 on page 22). Since the GPS connector is small and space is limited, you should connect the GPS antenna before making other connections.

Ensure that the DVR storage allocation and usage options for GPS data are set to one percent. If the value is not as expected, see “Storage allocation and usage” on page 62 for details on how to modify the value.

The GPS antenna is usually mounted on the roof of the vehicle on a flat surface directly above the DVR. The length of antenna cable and other equipment on the vehicle roof dictate the specific location.

To install the antenna:

1. Determine a suitable mounting location on the vehicle roof for the antenna.
2. Using the antenna as a template, measure the diameter of the mounting shaft and drill a hole through the roof of the vehicle.
3. Route the antenna cable through the hole.
4. Place waterproof sealant around the bottom of the antenna and press the antenna into place.

   This is the permanent mounting location of the antenna.
5. From the interior of the vehicle, thread the antenna locking nut and washer over the antenna cable and tighten the mounting shaft.
6. Route the antenna cable to the DVR assembly, and then secure to the GPS connector.

Chapter 6
Testing

This chapter explains how to test MobileView equipment to make sure the system is operating correctly. You can configure and test the cameras, inputs, and outputs using a laptop computer.

Content

MobileView PENTA testing

MobileView PENTA is preconfigured for eight cameras at 30 fps per camera, dual- channel audio, and a panic button on input 1. Configuration tasks require setting numerous variables and parameters to meet customer and installation requirements. When you set and save these tasks, you can test the system.

MobileView PENTA Hardware Monitor

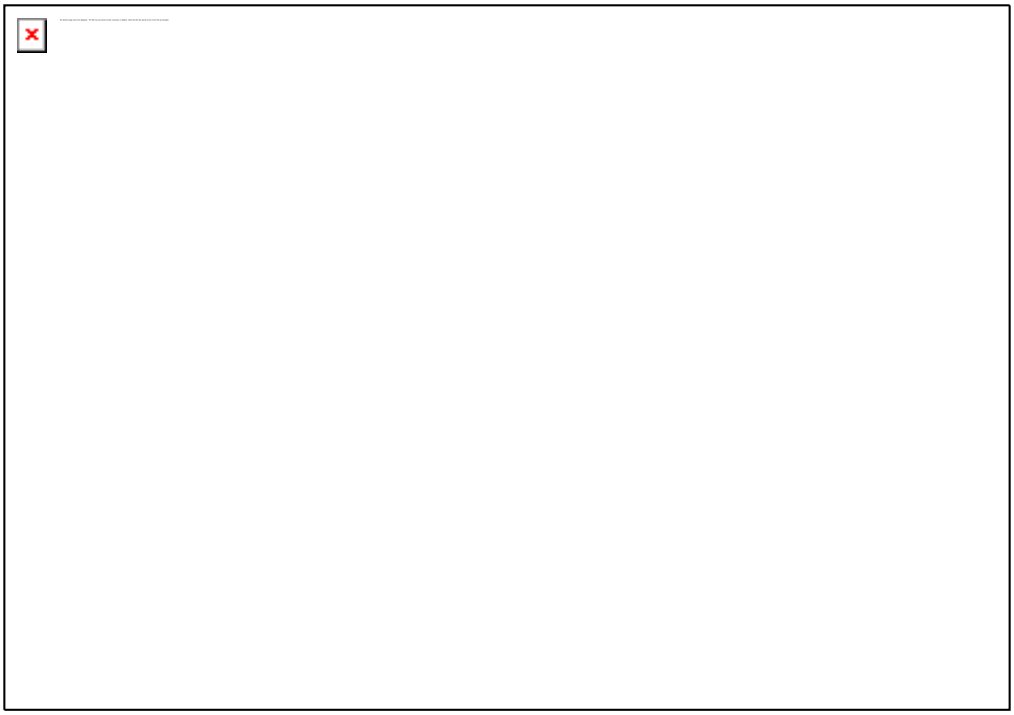
The DVR contains the MobileView PENTA Hardware Monitor program. This utility has many low-level diagnostic capabilities that are beyond the scope of this manual. Others are useful for testing DVR functionality.

To open the MobileView PENTA Hardware Monitor program:

1. Establish a remote desktop session. (See “Remote desktop connection” on page 44.)
2. Locate and open the MobileView PENTA Hardware Monitor program on the remote desktop (Figure 58).

   When opening the MobileView PENTA Hardware Monitor, the system automatically prompts you to stop the service. When you close the MobileView PENTA Hardware Monitor, the system restarts the service.

Figure 58: MobileView PENTA Hardware Monitor



Watchdog on/off

The system watchdog monitors low-level system communication between system software and hardware. If communication is interrupted for a period of 20 minutes, the watchdog process shuts down and restarts the DVR.

Starting the MobileView PENTA Hardware Monitor program requires stopping low-level communication and therefore automatically turns off the watchdog. Watchdog On and Off buttons control watchdog operation. To indicate the Watchdog is off, the front panel LCD displays a “Wdog OFF” message and both the software and camera status output LEDs blink rapidly. There is no external indication when the watchdog is running.

LEDs and relays

You can test the software LEDs via the MobileView PENTA Hardware Monitor program. Check the appropriate box for the LED to test, and then click send (Figure 59). The LED lights momentarily.

You can also test the relays. Select the relay to activate and click Send (Figure 60 below). Relay activation is generally audible, but no external display indicates relay status.

Figure 59: LED options

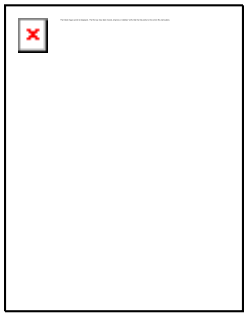
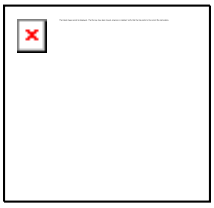


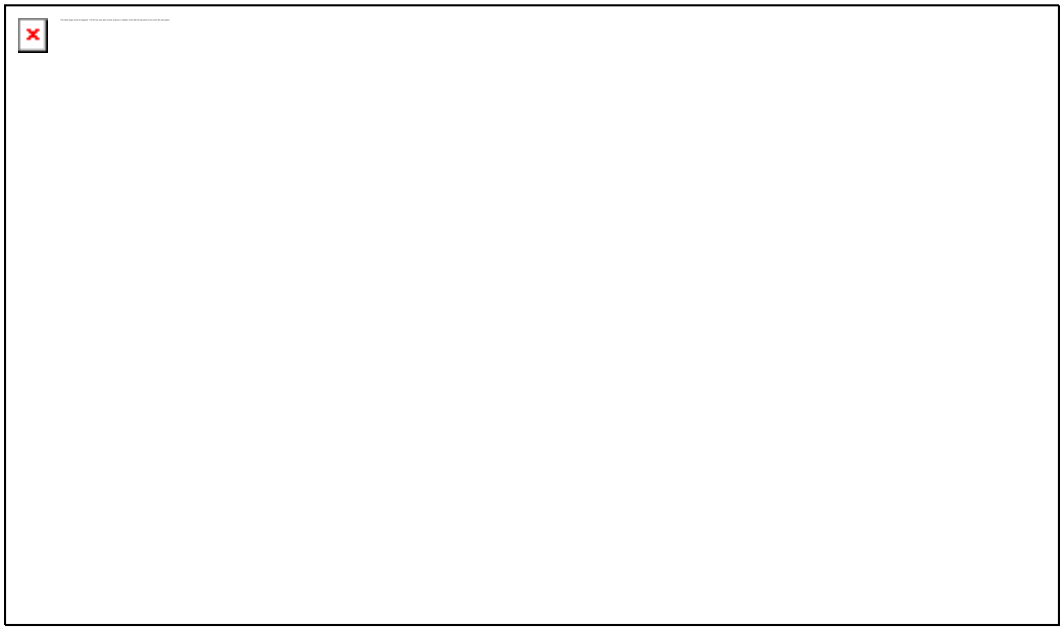
Figure 60: Relay options



GPS testing

You can test the GPS subsystem using the MobileView PENTA Hardware Monitor program. Information relevant to users and installers is limited.

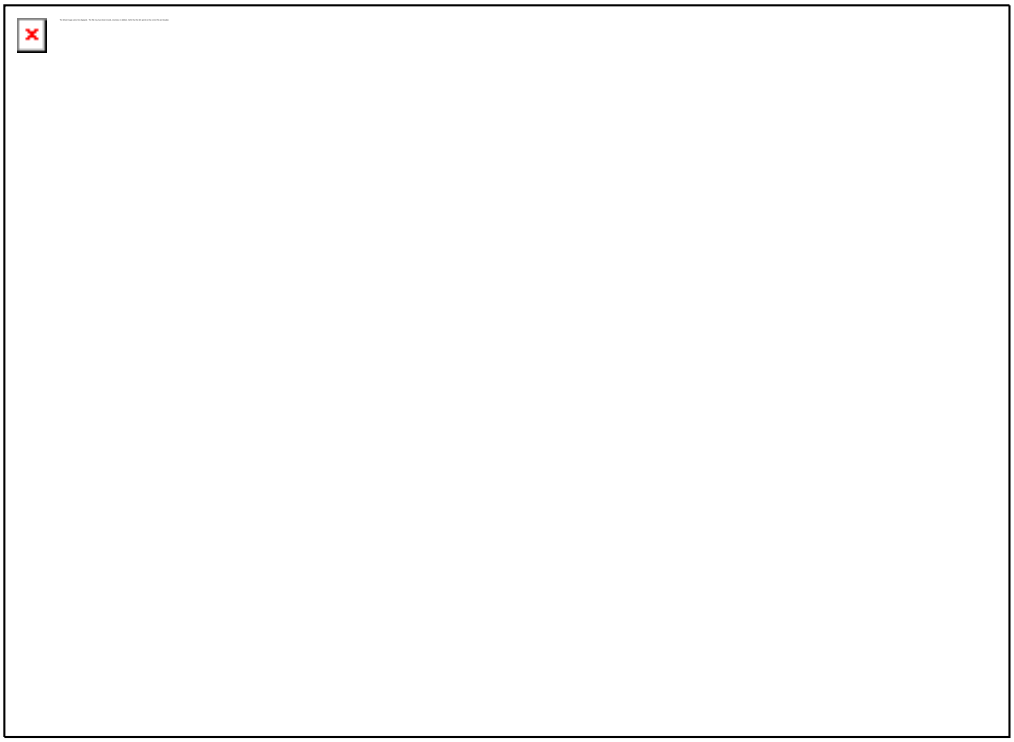
Figure 61: GPS Tracking View



Real-time inputs

The most useful part of the MobileView PENTA Hardware Monitor program is the real-time inputs screen (Figure 62 on page 83). This screen shows the status of every user-controllable MobileView input, output, fan, fuse, and voltage level on the DVR.

Figure 62: Real-time input options



Analog inputs

The MobileView PENTA DVR lets you monitor two analog signal inputs. Analog inputs are generally used to measure such things as pressure, temperature, and velocity. These variables are commonly available on heavy-duty vehicles. Once these are converted to electrical inputs in the ranges of 0 to 30 V, the DVR can monitor and act upon them.

The value directly under each bar is the digital value between 1 and 255 of each analog input. The digital value is necessary to create an event based on an analog input.

To determine digital values for analog input conditions:

1. Change the state of the analog input to the condition under evaluation.
2. Record the input value at that condition.
3. Repeat steps 1 and 2 for each condition.
4. Repeat steps 1 through 3 for each input.

Voltages and temperatures

Key input and output voltages are shown here. One critical monitor is input VIN. This provides the input voltage to the DVR from the vehicle. The nominal voltage is 24 V. Common regulated voltage from a running vehicle is approximately 27.5 V. Common battery voltage from a stationary vehicle varies between 22.5 and 24.5 V depending on battery state. Observing this input helps determine why the system shuts down in over or under voltage conditions.

System temperature is also shown in this screen (Figure 62 on page 83). This screen shows what external or internal factors create overheating conditions.

Relay testing

Each relay activates and deactivates in succession when you click the Enable Relay Testing checkbox.

Fan and fuse status

The DVR front status LCD provides a summary of fan and power conditions. The real-time input screen (Figure 62 on page 83) shows detailed information about each fan and fuse. A checkmark icon indicates the fan or fuse is working. A warning icon indicates a problem.

Status indicators

The DVR has ten digital inputs. The circle shown on the right side of the real-time input screen (Figure 62 on page 83) indicates the status of each input. All inputs use a black circle to indicate the off state. The on state is shown by red and green circles.

In the Alarm events configuration screen, an input on state equates to Activated while input off state equates to Deactivated.

Logging off

Once you complete the review and testing of your DVR’s main features, log off from the DVR.

To log off:

1. Close the Real-time inputs screen.
2. Close the MobileView PENTA Hardware Monitor program. The DVS server restarts automatically.

3. Log off the remote desktop session.

Video manager program

Another way to test system operation is to use the Video Manager program to view video in the same manner as a system operator. Video Manager applications are found in the *MobileView Video Manager User Manual*.

Items to check using the Video Manager application include the following:

- Camera name and resolution during playback
- Event activations based on programmed inputs
- Archival storage and playback
- Text overlays to ensure accuracy of information and readability
- General system configurations such as DVR name and system date/time
- Audio input

Chapter 7
Troubleshooting and support

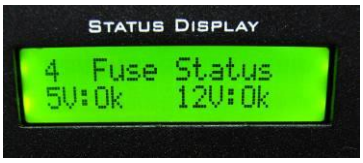
This chapter provides information to help you troubleshoot problems and shows you how to contact technical support, should you need assistance with your PENTA DVR or MobileView system.

Content

Troubleshooting

The system LCD displays detailed, real-time information about the status of the MobileView PENTA DVR. See Table 9 below for details on what each LCD message indicates.

Table 9: System LCD messages

No	Message	Details
1		Firmware Screen - occurs on start.
2a		Default Screen 1 – indicating ignition is on and the watchdog is off.
2b		Default Screen 2 – indicating ignition is on, software is running and all cameras are recording.
3		Digital Input Screen – indicating input 3 is active.
4a		Fuse Screen – indicating both 5V and 12V fuses are okay.
4b		Fuse Screen – indicating 5V fuse is okay and a failed 12V fuse.
5a		GPS Screen – indicating that the GPS is actively tracking satellites.
5b		GPS Screen – indicating that the GPS is not tracking satellites.

No	Message	Details
6a		Fan Screen – indicating fans are okay.
6b		Fan Screen – indicating fan failure.
7a		Hard Drive Screen – indicating that the hard drive caddy is present and locked.
7b		Hard Drive Screen – indicating that the hard drive caddy is present but un-locked.
8		Watchdog Counter Screen – indicating a zero hexadecimal count of the watch dog timer.

Contacting us

For help installing, operating, maintaining, and troubleshooting this product, see this document and any other documentation provided. If you still have questions, contact us during business hours (Monday through Friday, excluding holidays, between 5 a.m. and 5 p.m. Pacific Time).

North America

T: +1 888 437 3287 (Toll-free in the US, Puerto Rico, and Canada)

Note: Be ready at the equipment before calling.

Online resources

Here are some useful links on our Web site, www.interlogix.com.

Link	Description
Warranty and terms information	From the Customer Support menu, select Return and Warranty Policy Statement or Terms and Conditions Policy Statement .
Customer service and technical support	From the Customer Support menu, select Customer Service or Technical & Application. Select the appropriate product category for the contact information or use the menu to select a location outside the US.

Appendix A
Checklists and worksheets

Summary

This appendix provides a checklist, a worksheet, and a mounting plate template.

Content

DVR installation checklist

The MobileView DVR has numerous options and variables that need to be addressed during an installation and checked thereafter. The DVR installation checklist on these pages provides a means of recording most system variables in one document.

The installation checklist (Table 10) is provided as a guide. It should be completed by the installation contractor and signed by a property representative. This checklist can be the permanent record of system configuration at the time of installation.

Table 10: Installation checklist

Property name:	Vehicle/fleet number:
Installation date:	Vehicle make/year:
DVR serial number:	DVR software version:

Table 11: DVR commissioning checklist

Item	Good	NA	Comments			
MV event button status LEDs	☐	☐	Good = Green LED only on status tag.			
DVR LCD	☐	—	System Status:	Fuse Status:	Fan Status:	HDD Status:
			I: On S: Run C: Ok	5V: Ok 12V: Ok	Running	Present-locked
Continuous power (~24 VDC protected)	☐	—	Protective device used? (circle one) 10 A CB 10 A fuse			
Ignition power (~24 VDC protected)	☐	—	Protective device used? (circle one) 1 A CB 1 A fuse			
DVR installed properly	☐	—	Mounting plate secure, backbox secure, HDD accessible, sufficient ventilation, backbox accessible.			
J1708 module	☐	☐	+ - 12VDC power wired to Module terminals labeled 12VDC and GND. DB9 cable connect at SERIAL 2 DVR Port. FLTSettings_GE.ini : UseJ1587=Y added under [System Settings] and J1587ComPort=3 under [J1587Settings]			
Camera housings/bezels	☐	—	Secure, evenly tightened, blue LocTite on housing screws, glass clean.			

Item	Good	NA	Comments
Wireless antenna	☐	☐	Connected and sealed.
GPS antenna	☐	☐	Connected and sealed. DVR S/WARE LED 2 Green (sat fix) & COMS LED 4 flashing
Cisco radio	☐	☐	Radio grounded, Antenna cable connected, Ethernet cable connected from PSU ETHERNET Port to DVR GigaBit NET Port. Radio LEDs active. Input power fused with SloBlo fuse at 600mA for 24VDC or 1.7A for 12VDC.
WiMax radio	☐	☐	Antenna cables connected, Ethernet cable connected from radio to DVR GigiBit NET port.
Impact sensor	☐	☐	Installed properly (oriented correctly and mounted to a surface not subject to vibration).
Accelerometer	☐	☐	Installed/calibrated properly (oriented correctly, calibrated using MV4 Monitor tool, mounting surface not subject to vibration).
DVR time zone, time, and date	☐	—	Confirm Time Zone, time and date are correct.
Backbox IP address	☐	☐	Confirm Backbox IP, Subnet, and Gateway if applicable. Refer to Customer provided list if applicable.
Cameras	☐	—	Confirm all cameras installed are functioning, clear images, and save jpg images one for each camera.
Depot and vehicle ID	☐	—	Confirm Depot ID and Vehicle ID are entered correctly per end customer requirements (refer to DVR configuration checklist if completed).
MV event button enabled and tested	☐	☐	Enabled and tested: 1) Use PENTA Monitor to test input functionality, and 2) Push button and confirm event recorded in Log Record.
Impact sensor enabled and tested	☐	☐	Enabled and tested: 1) Use PENTA Monitor to test input functionality, 2) Strike the sensor in the x or y direction and confirm event recorded in Log Record.
Accelerator enabled	☐	☐	DVR input configured and enabled for correct G Force with correct alarm event reaction.
Audio tested	☐	☐	Tested if present.
Deleted archive files and Outgoing folder	☐	—	Delete Archive files from the Archive (E:) partition and delete all files from the Workspace (D:)/Outgoing Folder.
IR illuminator	☐	☐	Installed and aligned properly. Secured.

DVR viewer configuration checklist

Table 12: Property information, DVR and client viewer vehicle settings

Property information	
Property name:	
Vehicle fleet numbers (attach separate list if necessary):	
DVR date and time, workgroup, backbox network settings	
DVR time zone set to:	DVR workgroup (default is GE):
Front panel network IP/subnet (default 192.168.0.100/255.255.255.0):	
GigiBit NET Port IP/subnet (default is DHCP):	
Client viewer vehicle settings (no spaces or special characters)	
Depot ID:	Vehicle ID:

Table 13: Camera settings

Camera	**Capture rate (fps):**	**Picture resolution**	**Vehicle ID:**
Camera 1 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 2 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 3 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 4 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 5 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:

Camera	Capture rate (fps):	Picture resolution	Vehicle ID:
Camera 6 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 7 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 8 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 9 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 10 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 11 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 12 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 13 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 14 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:

Camera	Capture rate (fps):	Picture resolution	Vehicle ID:
Camera 15 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:
Camera 16 Record images? Y N Color? Y N B & W? Y N		(circle one) 320 x 240 640 x 240 D1	Camera name: Description:

Table 14: Audio settings

Client viewer audio settings	
Microphone 1 (circle): None Installed/enabled	Microphone 2 (circle): None Installed/enabled
Location:	Location:

Table 15: Alarm events and system settings

Client viewer alarm events					
Event/input list	Enabled? (circle)	Event activation (check)	Event reaction		
Event input (MV panic button	Y N	___Activated (closed) ___Deactivated (open) ___VDC input	Create archive ___	Pre (min):	Post (min):
Impact sensor	Y N	___Activated (closed) ___Deactivated (open) ___VDC input	Create archive ___	Pre (min):	Post (min):
	Y N	___Activated (closed) ___Deactivated (open) ___VDC input	Create archive ___	Pre (min):	Post (min):
Accelerometer	Y N	___G-Force X: ____ ___G-Force Y: ____ ___G-Force Z: ____	Create archive ___	Pre (min):	Post (min):

Client viewer alarm events					
	Y N	___Activated (closed) ___Deactivated (open) ___VDC input	Create archive ___	Pre (min):	Post (min):
	Y N	___Activated (closed) ___Deactivated (open) ___VDC input	Create archive ___	Pre (min):	Post (min):
	Y N	___Activated (closed) ___Deactivated (open) ___VDC input	Create archive ___	Pre (min):	Post (min):
Wireless radio power on	Y N	___Activated (closed) ___Deactivated (open) ___VDC input	Create archive ___	Pre (min):	Post (min):

Client viewer system settings		
System settings	Shutdown dwell time (DVR shutdown delay minutes):	
Camera settings	Number of cameras installed:	Camera shutdown dwell time (min):

Customer/contractor acceptance		
Customer signature:		Print name and date:
Installer signature:		Print name and date:

Vehicle layout

On the layout diagram shown in Figure 63 on page 98, indicate the types and locations of all cameras to be installed. Use the following abbreviations:

- FL: Flush mount
- RC: Recessed

- FF: Variable focus forward-facing

Figure 63: Vehicle layout

Vehicle length (ft.) _____

Articulated (circle one): Yes or No

Camera legend:

- FL camera #: _____
- RC camera #: _____
- FF camera #: _____

Notes:

Appendix B
Templates and dimensions

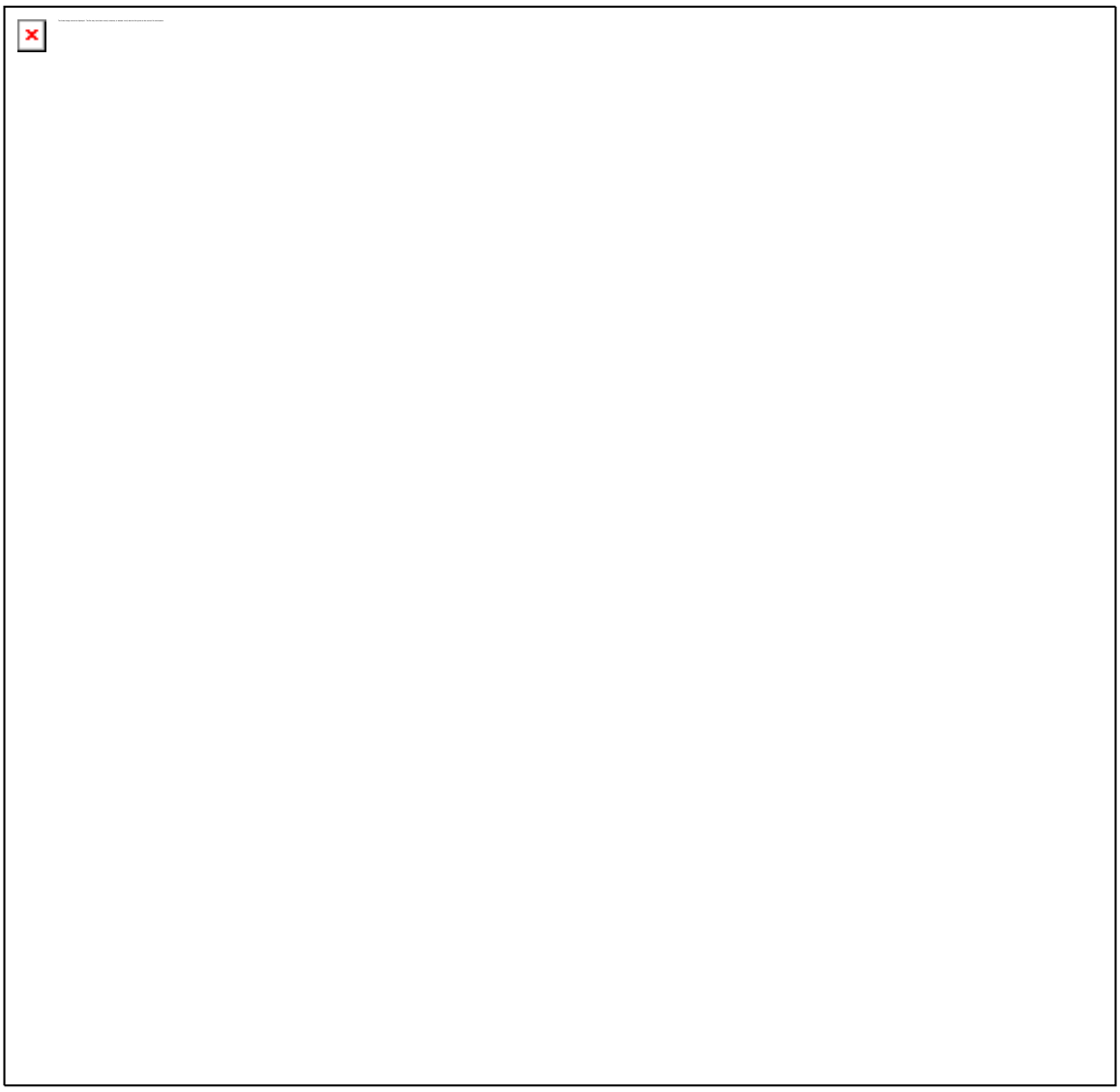
Summary

This appendix provides templates and dimensions to help you install the MobileView PENTA system.

Camera mounting plate template

Use this mounting template to drill the holes for the mounting plate in the correct places.

Figure 64: Mounting plate template

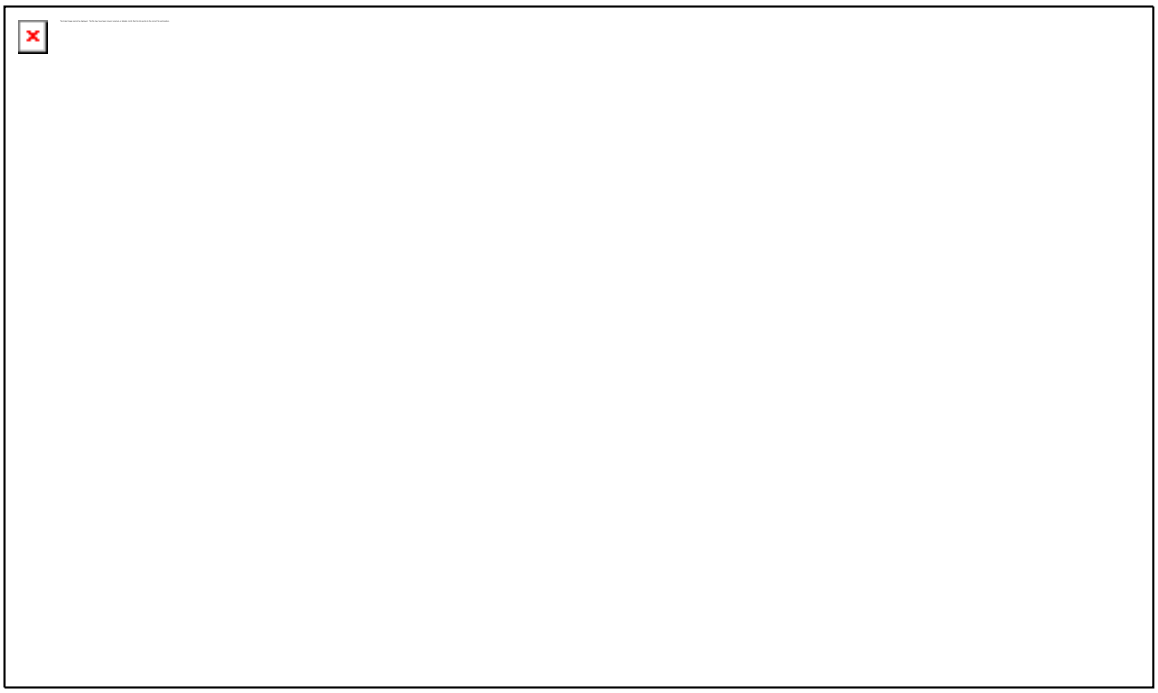


DVR base plate

Use this mounting template to drill the holes for the mounting plate in the correct places.

Figure 65: DVR base plate 1

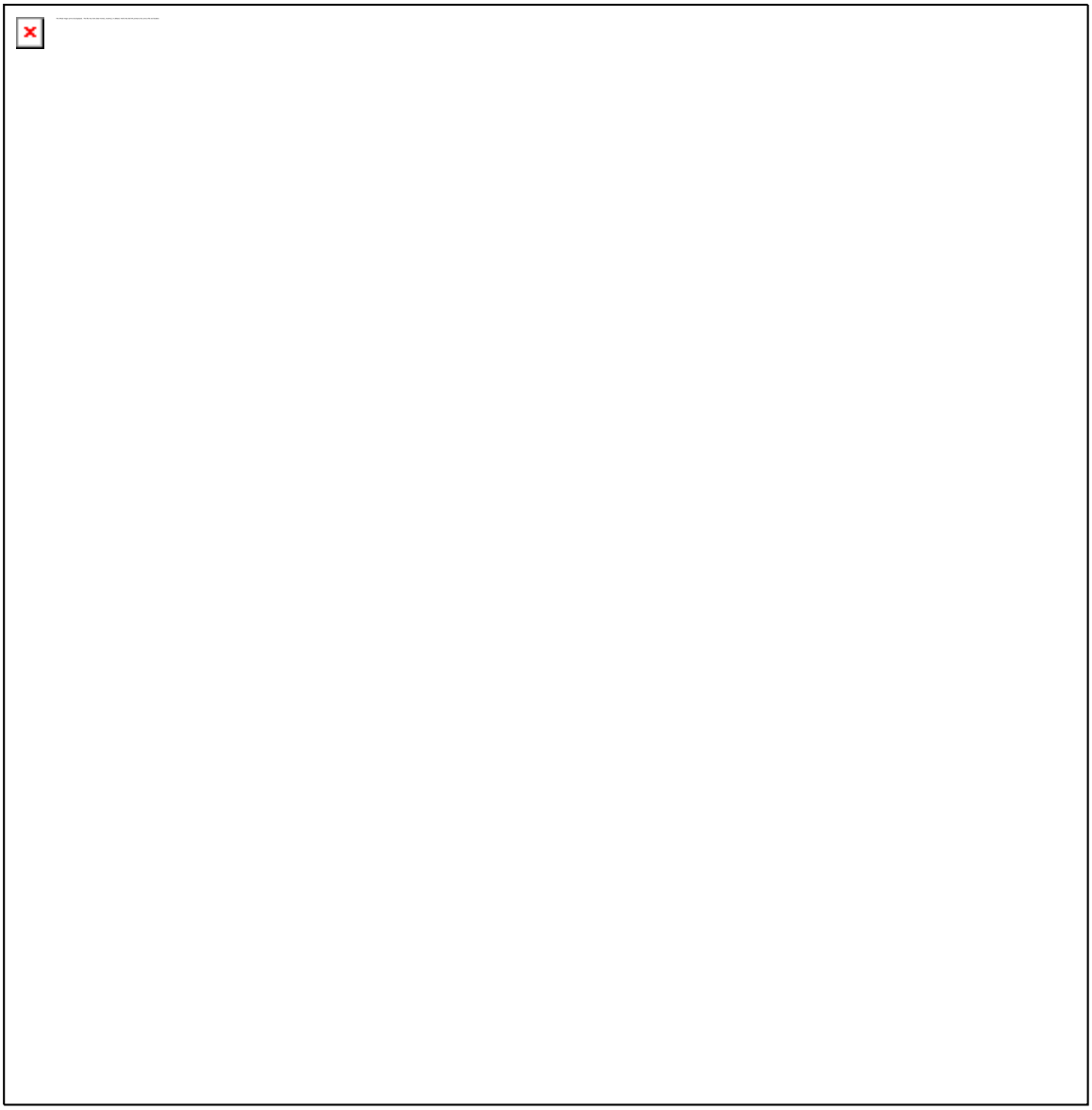
Figure 66: DVR base plate 2



DVR assembly dimensions

Figure 67 below provides the DVR assembly dimensions.

Figure 67: DVR assembly dimensions



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