

GATEKEEPER



SYSTEMS INC.

Safety, Security, Peace of Mind™

816-HD USER GUIDE AND MANUAL



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Introduction.

Congratulations on the purchase of the Gatekeeper Systems 816-HD DVR. This Digital Video Recorder offers H.264 compression, the same compression technique as used in Blue Ray disk players, which produces crystal clear, best in class, video imagery.

The 816-HD records to a removable Hard Disk Drive, The COMRAD™. The COMRAD™ contains up to 2 spinning or solid state drives. Utilizing state of the art surface mount components the 816-HD is built to withstand the shock and vibration of vehicle operation. In order to play back the recorded video the 816-HD utilizes custom video viewing software, "G4 Viewer", which is a very easy to use application which allows users to quickly find the video of interest and save a clip. With the press of a button users can print images and then send them to qualified staff.

The battery should be disconnected from the vehicle before working on the electrical system of the vehicle when installing, servicing or removing Gatekeeper products.

All Gatekeeper employees or contractors who preform electrical work (install, service or remove a DVR, installing a backup camera system for example) on a customer vehicle shall ensure that the battery in the vehicle is disconnected before work commences.

Customers shall be responsible for addressing any systems on the bus which require attention as a result of disconnecting the bus battery. This includes, but is not limited to, entering a radio theft code, programing radio stations etc.

Glossary.

DVR	Digital Video Recorder; A DVR functions similarly to a VCR, except it uses a disk to record, as opposed to video-tapes.
H.264	H.264 contains a number of features that allow it to compress video much more effectively than older standards and offers up to twice the compression of the current standards.
OSD	On Screen Display; Is an image superimposed on a screen picture commonly used to display information such as volume; channel; time; status, etc. and can be used to change the specific values for all configurable options.
UTC	Coordinated Universal Time is a time standard based on International Atomic Time with leap seconds added at irregular intervals to compensate for the Earth's slowing rotation.
HD	Denotes that the 816-HD system utilizes a state of the art mobile rated internal SATA hard disk drive.



Important Safeguards and Warnings.

The battery should be disconnected from the vehicle before working on the electrical system of the vehicle when installing, servicing or removing Gatekeeper products.

All Gatekeeper employees or contractors who perform electrical work (install, service or remove a DVR, installing a backup camera system for example) on a customer vehicle shall ensure that the battery in the vehicle is disconnected before work commences.

Customers shall be responsible for addressing any systems on the bus that require attention as a result of disconnecting the bus battery. This includes, but is not limited to, entering a radio theft code, programming radio stations etc.

Remove Main Power Fuse or Disconnect Vehicle Batteries Prior To Any Electrical Work Or Jump Starting The Vehicle.



Firmware updates (available from www.gatekeeper-systems.com when released) are system specific, firmware updates must only be applied to the 816-HD system. If this firmware is applied to any other Gatekeeper Systems DVR **warranty will be void.**

The 816-HD has an operating temperature range of -40° C to +65° C. It is good practice to ensure that the 816-HD is mounted in an area in which acceptable temperature ranges are experienced.

Do not remove the cover of the 816-HD series as this will void any warranty.

When a system has shipped with a GPS antenna, ensure that the GPS antenna is mounted externally on the roof of the bus, magnetic side down.

Do not format the COMRAD™ HDD using Microsoft Windows.

If at any time there is a question about how to proceed, contact Gatekeeper Systems Inc. at 1-888-666-4833 or 604-864-6187 immediately for directions. Review all installation documentation, including technical bulletins. Additional Resources; Technical Bulletins and Product Tutorials can be found in the Gate section of www.gatekeeper-systems.com



Package Checklist.



816-HD Digital Video Recorder.



Sensor Cable: P/N: CAB000323



Power Cable: P/N: CAB000333



Key



Power Line Fuse



Ignition Line Fuse



CABLE GUARD



Fastening Screws



2 PER UNIT



GPS



CAB000310 Camera Adapter Cable.



816-HD Mounting Plates [X2]



Download Kits

Gatekeeper Systems offers additional Download Kits which enhance the usability of the 816-HD. These download kits have been designed to assist in the management; configuration and maintenance of the 816-HD.

HD Download Kit

Part Number = **G4-8XXHDDLK**

Contains:

- Remote Control
- G4-S28 HDD READER
- CD with G4 Viewer
- RC150 Cable (single RCA male to male)
- CAB000362 (Video Out Aviation Connection to RCA)
- CAB 000157 ((Video Alignment Cable) See Appendix)

HD Download Kit Plus A

Part Number = **G4-8XXHDDLKA**

- G48XXHDDLK
- Plus a 7" battery powered monitor

HD Download Kit Plus B

Part Number = **G4-8XXHDDLKB**

- G4-8XXHDDLK
- Plus an ICD = Interactive control display and cable.



System Overview.

Front View.

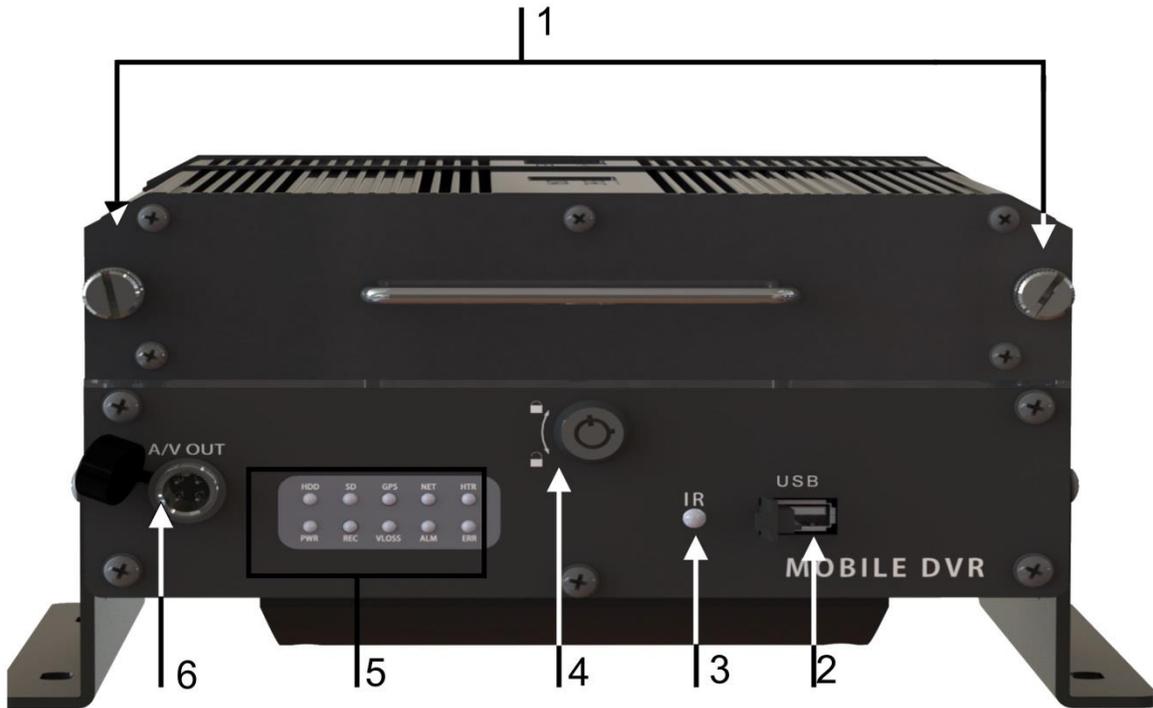


Figure 1: 816-HD Front View.

1. Hard Drive (COMRAD™) retention screws.	2. USB Cover.																				
3. IR Receiver. For receiving signals from the Remote Control.	4. Lock. Allows access to the HDD and can start & stop recording of video.																				
5. LED Status Indicators.	6. AV Out. Connects to External Display.																				
<table border="1"> <tr> <td>HDD</td> <td>When illuminated indicates that a COMRAD™ is present.</td> </tr> <tr> <td>SD</td> <td>Displays if a SD card is present in the system.</td> </tr> <tr> <td>GPS</td> <td>Illuminated when GPS signal is present</td> </tr> <tr> <td>NET</td> <td>Displays Network activity</td> </tr> <tr> <td>HTR</td> <td>When illuminated HDD Heater is active.</td> </tr> <tr> <td>PWR</td> <td>Illuminated when power present</td> </tr> <tr> <td>REC</td> <td>Illuminated when recording.</td> </tr> <tr> <td>VLOSS</td> <td>Flashes if Video Loss has occurred.</td> </tr> <tr> <td>ALM</td> <td>Signifies the 816-HD has received an Alarm input.</td> </tr> <tr> <td>ERR</td> <td>A Physical Hardware error.</td> </tr> </table>		HDD	When illuminated indicates that a COMRAD™ is present.	SD	Displays if a SD card is present in the system.	GPS	Illuminated when GPS signal is present	NET	Displays Network activity	HTR	When illuminated HDD Heater is active.	PWR	Illuminated when power present	REC	Illuminated when recording.	VLOSS	Flashes if Video Loss has occurred.	ALM	Signifies the 816-HD has received an Alarm input.	ERR	A Physical Hardware error.
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Rear View.

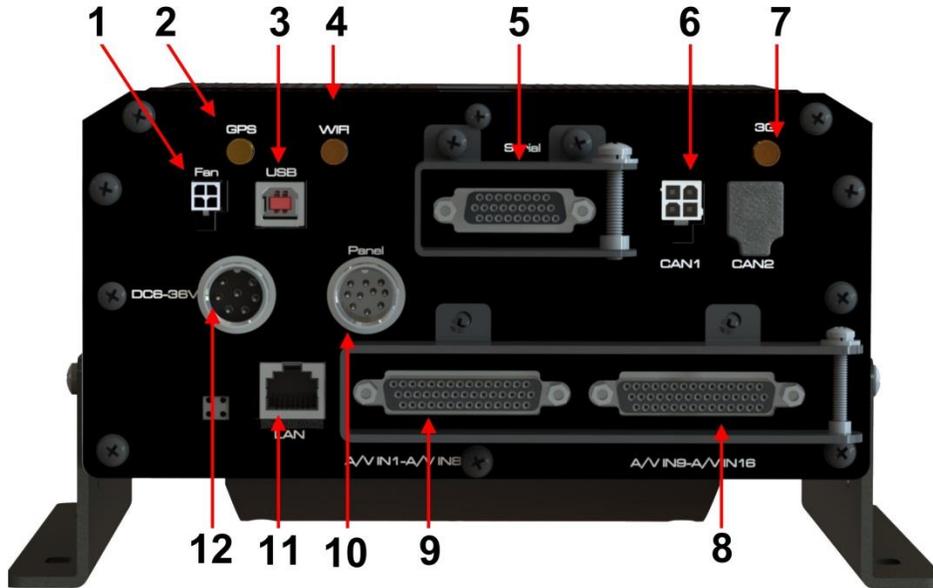


Figure 2: 816-HD Rear View.

1. Power supply for the integrated base fan.		2. GPS connector for a GPS enabled 816-HD.
3. USB Connection. Reserved for future development.		4. Wi-Fi connector for a Wi-Fi enabled 816-HD.
5. Sensor (CAB000323) connection.		6. CAN1. Reserved for future development.
7. 3G connector for a Cellular enabled 816-HD.		8. Cameras 9 to 16 fly lead connector.
9. Cameras 1 to 8 fly lead connector.		10. ICD (optional extra) connector.
11. LAN connector.		12. Power Cable (CAB000333) connector.

Mounting the System.

Installation / Environmental Requirements.

The 816-HD has an operating temperature range of -40° C to +65° C. It is good practice to ensure that the 816-HD is mounted in an area in which acceptable temperature ranges are experienced. Please fully read and understand the following conditions to ensure the Warranty will not be voided.

1. The 816-HD operates between 8V ~ 36V. Please ensure a regulated, consistent power source is available for the 816-HD.
2. DO NOT remove any enclosures/covers associated with the 816-HD as this will void the warranty.
3. Remove the In-Line Power fuse prior to jump starting the vehicle.
4. Select a solid ground connection for the 816-HD.
5. Do Not use any third party accessories, unless approved by Gatekeeper Systems.
6. The 816-HD is designed for interior use only. Do not install in areas which are exposed to excessive moisture / wetness.
7. Mount 816-HD in a location which has good air-flow and is not subject to excessive heat/cold variations. Allow at least 6" of clearance all round for effective cooling of the system.
8. Ensure that the 816-HD is mounted where it is not easily accessible by non-authorized personnel.
9. Ensure that ALL provided Split Looms are used around exposed cables. Grommets are to be used as directed by install sheet. Failure to use provided Split Looms and Grommets will void the warranty.
10. Gatekeeper Systems provides Tek Screws with which to mount the 816-HD, these have been tested and are approved for mounting.



Power Connection.

The supplied fuses MUST be used, failure to protect the system with the correct value fuse may lead to the warranty being voided.

The 1AMP fuse must be installed as close as possible to the source on the Yellow Ignition wire on CAB000333
 The 15AMP fuse must be installed as close as possible to the source on the Red [+12V] wire on CAB000333

Power Connector (CAB0000333)



GND (A) Input (Black): Connect to the negative terminal of the battery, -12V.
Ignition (B) (Yellow): Connect to vehicle ignition. +12V signal required to activate the 816-HD. Ensure that the provided 1 AMP In-Line fuse is used
Positive (C) (Red): Connect to the positive terminal of the battery, +12V. Ensure that the provided 15 AMP In-Line fuse is used

Sensors

The 816-HD allows for up to six sensor inputs, all of which are user configurable, with Sensor 1, 2 and 3 being pre-configured in the DVR, see table below. The individual wires from these Six sensor connections are approximately Five meters long.

CAB000323		
Sensor Wire and Color	Sensor	OSD Name
SENSOR_IN1 (Red)	Brake	BK
SENSOR_IN2 (Red)	Warning Lights	WN
SENSOR_IN3 (Red)	Stop Arm	SA
SENSOR_IN4 (Red)	Door	DR
SENSOR_IN5 (Red)	Left Turn	LT
SENSOR_IN6 (Red)	Right Turn	RT
SENSOR_IN7 (Red)	Not Assigned	Blank
SENSOR_IN8 (Red)	Not Assigned	Blank

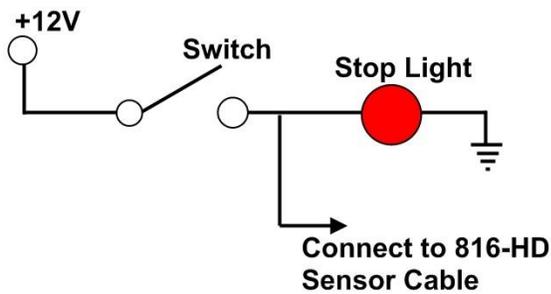


Figure 3: Sensor Connection Example



SENSOR'S 1-6 are inputs. In the example on the right S1 has been set up for Brakes; S2 for Warning Lights.

Using the On-Screen menu go to SETTINGS → EVENT → SENSOR, enable the required sensors for the install, make sure the alarm switch is ON for each required sensor.

Once Sensors have been set, Click SAVE.

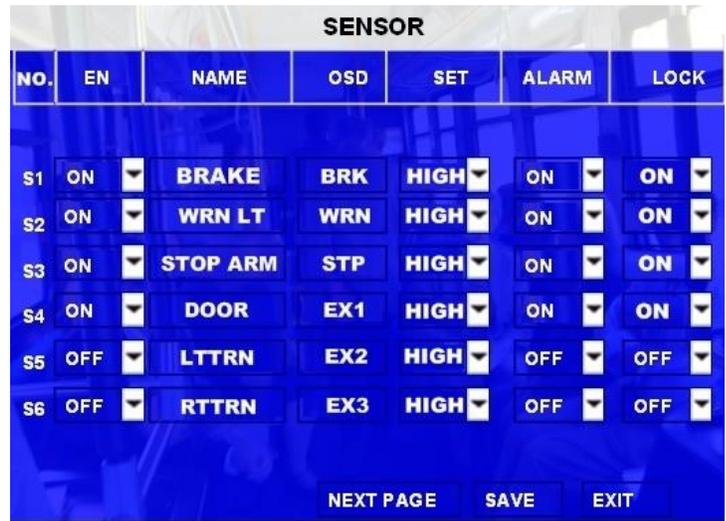


Figure 4: Sensor Setup.

GPS

The 816-HD can be outfitted with an optional GPS module. For optimum results it is recommended that the GPS module be exterior mounted utilizing the magnetic base with the cable protected by a suitable grommet. If it is not possible/practical to have the GPS module exterior mounted, the GPS module must be mounted internally with a direct line of sight vertically skyward.

Driver Alert Button.

A Driver Alert Panel is available as an optional accessory for the 816-HD. The Driver Alert Panel must be installed using the provide Tek screws. The Driver Alert allows for the driver of the vehicle to press the button and mark the recorded video with an Alert. This makes searching for Alerts far faster and easier as G4 viewer can be set to display Alarms/Alerts.

The Driver Alert Panel is connected to CAB000323.

CAB000323 has two bundles of wires labeled 485-3 and 485-4.

Connect the Driver Alert Panel to bundle 485-3 as follows:



CABLE	CABLE	PERIPHERAL → EXT. COM SETUP
CAB000323	DRIVER ALERT CABLE	Mode BUS
RED +5V	RED 5V	COM1 NONE (232-1)
BLACK GND	BLACK GND	COM2 NONE (232-2)
BROWN 485A	WHITE 485A	COM3 CONTROL PANEL (485-3)
BROWN/WHITE 485B	GREEN 485B	COM4 NONE

The Driver Alert Panel requires setting up in the configuration of the 816-HD. Navigate to Settings → Peripheral → Ext.Com Setup.



Using the COMRAD™ Docking Station.

The 816-HD utilizes a COMRAD™ drive system which can contain up to Two hard disk drives (max 2TB total Capacity) making it extremely portable and thereby easy to download; view and share video files.

NOTE: It is essential that the COMRAD™ Docking Station be physically connected to the COMRAD™ and also connected to a PC by using either the supplied USB or ESATA cable prior to the ac power adapter cable being applied.

Failure to follow this procedure may result in damage to the COMRAD™ Docking Station; the COMRAD™, or both devices.

The COMRAD™ Docking Station is a small device designed specifically for the retrieval and viewing of recorded video from an 816-HD system. To use the COMRAD™ Docking Station the COMRAD™ must first be removed from the 816-HD, ensure that the 816-HD has fully powered down prior to its removal.

Once the COMRAD™ has been removed place it on a flat, stable surface in proximity to a Windows based PC.



The COMRAD™ Docking Station is of a Keyed design ensuring correct alignment of the pins contained on the COMRAD™ to the housing on the COMRAD™ Docking Station.

Align the Alignment key, (located on the right hand side of the COMRAD™ Docking Station when looking at the back), on the COMRAD™ Docking Station to the Alignment Key Slot on the COMRAD™ and push the two devices together.



Once this is complete connect either the USB or ESATA cable to the back of the COMRAD™ Docking Station and insert the other end of the cable into the corresponding port on a Windows based PC. Once these connections have been made, insert the powered AC Power adapter to the back of the COMRAD™ Docking Station. Once Video has been reviewed; clipped; exported, etc. and the COMRAD™ is to be replaced into the 816-HD remove the power from the COMRAD™ Docking Station before disassembling the two devices.

Once the COMRAD™ Docking Station has been connected and powered up, the indicator LED's on the rear will become active. If the COMRAD™ Docking Station has been connected via the supplied USB cable the Yellow LED will be illuminated below the title USB. As the COMRAD™ Docking Station is being accessed the LED's for HDD1 and HDD2 will alternate as the drives are being accessed, this situation will only occur if the COMRAD™ has Two hard disk drives installed. The ESATA/USB connection will auto-detect which cable is being used of the transfer of data between the COMRAD™ Docking Station and the PC.





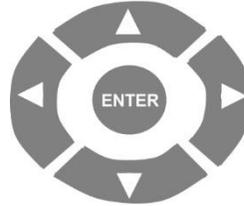
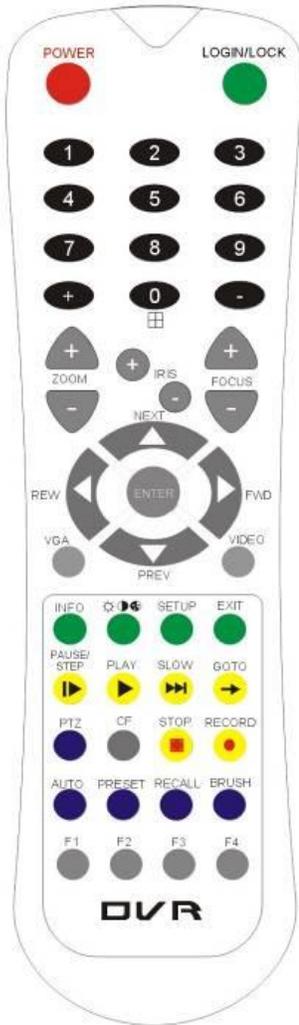
Once the COMRAD™/ COMRAD™ Docking Station/Computer connection has been made, when G4 Incident Management Software is launched underneath the HDD heading the connected COMRAD™/ COMRAD™ Docking Station will appear.

Please note that even if the COMRAD™ has two internal Hard Disk Drives only One HDD will appear when the COMRAD™/ COMRAD™ Docking Station is connected.





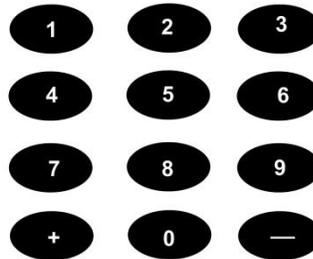
Using the Remote Control.



Use the ARROW keys to move between selections, input fields and icons.

Press ENTER to select.

And EXIT to return. Next and previous is also used to increase or decrease volume when at live or search screens.



Numeric

Use the numbers to input Values during system setup, Screen, or switch through the channels in live and playback.

Plus and Minus are used to increase or decrease setup values one by one.

Figure 5: Remote Control.

Numeric Keypad

[0-9] keys: When used during setup, number keys are used to key in values. For viewing channels 1, 2, 3 and 4 use 1, 2, 3 and 4 on numeric keypad respectively.

[+], [-] keys: During setup, plus and minus are used to select next or previous values.

Setup Menu Navigation:

▲ ▼: Up, Down directional keys: Moves selection up and down in setup menu.

▶ ◀: Left, Right directional keys: Moves cursor left or right in setup menu.

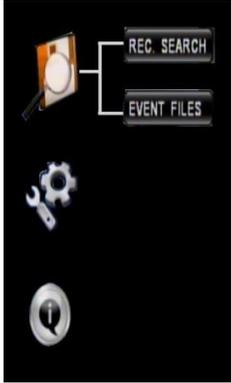
[ENTER] key: During setup, used to select and/or save an entry. During Playback ENTER will display the System information via the OSD overlay menu.

Username = 0 Password =20020818



System Configuration

The 816-HD utilizes a simple three option menu system.



Recorded Video menu option allows for the local playback of previously recorded video files, either by Recorded Search, or, Event Files.

The Second menu, System Settings , involves configuration of Networks/Wireless/Cellular, as well as advanced settings for Events/Alarms, etc.

The Third menu, System Information, gives detailed information in regards to System Settings; History; GPS and Wi-Fi Modules (if fitted).

Recorded Video

Recorded Video has two sub-menu's; REC. SEARCH and EVENT FILES.

REC. SEARCH.

When Record Search has been selected a secondary window will appear with several options, Figure 6.

1. SOURCE: This can be set to HDD or, if fitted, SD. By default the 816HD will search the internal HDD
2. TYPE: Options here are for recorded files. Options are ALL or Alarm.
3. DATE: Use the remote control to enter the required date of the video you wish to search for. Dates which have recorded video will be highlighted in Green.



Once the selections have been made highlight SEARCH and press enter on the remote control.

Figure 6: REC Search.

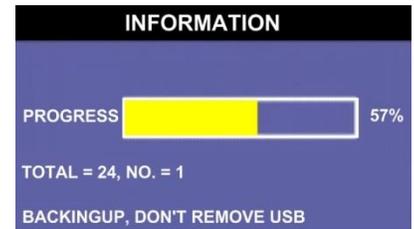
In the window which now appears options and information regarding the recorded video will be displayed.

1. CHANNEL: Displays the number of channels for which there is recorded video.
2. NO VIDEO; LOCK; NORMAL and ALARM: Displays the status of each channel in regards to recorded video.
3. TIME: Displays the Start; Intermediate and End time of the recorded video.
4. CH1; CH2; CH3; CH4: Displays which channel currently has the focus for playback. Use the Down Arrow on the remote control to select the channel required.
5. START TIME: Enter the Start Time of the required Search.
6. END TIME: Enter the End Time of the required Search.
7. REPLAY; UNLOCK; EXPORT; EXIT: Select the required option using the Arrow Keys on the Remote Control. Once the selection is highlighted, press the Enter button on the remote control.
8. REPLAY: Plays back the selected channels video file(s)





- 9. EXPORT: Exports the selected file to an external USB drive. Once selected a progress dialog window will appear. The USB device must be formatted in the 816-HD prior to exporting files.



- 10. UNLOCK: Unlocks the selected video file, this allows the 816HD to over-write previously write protected file(s).

EVENT FILES.

Video files which have had an Alarm Action or Event associated can be exported to an external USB drive by using the Event Files menu option under Recorded Video. The Event Files search is very similar in use to All Files.

Once Event Files has been selected an Event Search window will appear. This window allows for the selecting of File Type, e.g. Video Loss; IO (Input/Output) Alarm and a specific date. As with All Files, the Calendar at the top of the screen will have dates highlighted if they contain Event Markers.



Figure 7: Event Search.

IO ALARM	Displays Alarms triggered by Stop Arm, Warning Lights, Brake, etc. These Alarms are configured in System Settings → Event → Sensor.
ACCELERATION	Displays Events generated by the G-Sensor configuration. System Settings → Event → Acceleration
SPEED	Displays Events recorded generated by the configuration of System Settings → Event → Speed.
TEMP ALARM	Displays Events recorded generated by the configuration of System Settings → Event → Temperature.
MD ALARM	Motion Detection. NOT SUPPORTED
BD ALARM	Blind Detection. NOT SUPPORTED
VL ALARM	Displays Events recordings generated by Video Loss. Video Loss needs to be enabled for this event to be recorded.

The search was set for ALL and the result of the search displays the two events VL (Video Loss) and Over Speed. Both of these events have been selected in this screen as can be seen by the X listed under the SEL column. With a USB drive connected to the front of the 816-HD Export can now be selected using the remote control.

A dialog window will appear displaying the status of the Export.





System.

Under System Settings there are Five sub menu's; System; Record; Network; Event and Peripheral, each with their own sub-menu system.

DATE TIME.

There are multiple options which the user can select within Date/Time.

DATE FORMAT. Once highlighted press the ENTER key on the remote control. Date Format has to be manually entered. Once highlighted, press the ENTER key on the remote control and enter the date in the expected format. Once completed highlight the ↵ symbol and press the Enter key on the remote control. Highlight the Save button and press Enter.

Options: YYYY-MM-DD; MM/DD/YYYY; DD/MM/YYYY.

Default: MM/DD/YYYY

TIME FORMAT

Time format can be selected between 12HR and 24HR (Military Time). If 12HR is selected the option for AM/PM must be set to the correct setting to reflect the time of setup, e.g. 3:45 PM for an afternoon setup.

Default: 12HR

TIME SYNC SOURCE

Determines where the system will get its time from.

NONE: Time has to be manually input.

GPS: An approved GPS module must be connected. Once GPS has been selected and the option SAVED, there may be a slight time delay as the system sync's with the GPS satellites.

NTP: Reserved for future development.

Options. NONE; GPS; NTP.

Default: GPS

TIME ZONE

There are 24 Zones available from the Drop Down menu. Ensure that the correct zone for the location is chosen at time of installation. Failure to set the correct time zone will lead to the time stamp on the recorded video being out by X number of hours.

Default: -8

DST

Daylight Saving Time will only display if DST has been set to ON. To change the value highlight and use the ENTER button on the remote control. Once the required option has been set, highlight SAVE and press Enter.

Default: ON

DST MODE

Within this menu section there are Two options: Auto and Manual. If Manual is selected the start date and End date for DST must be entered.

Default: Auto

When Date Time has been set for 24HR; GPS with DST ON the dialog window will display as shown in Figure 8. Should different options be chosen, e.g. NTP for Synchronization, the window will appear with different user options.



Figure 8: Date / Time Setup.



FORMAT

Use this feature to format devices ready for use with the 816-HD. Use the remote control to highlight the required option and then press Enter to open the Options drop down window. Please note that Format will erase all data from the device being formatted. This erased data cannot be retrieved.



Device: Options: HDD1; HDD2; USB; SD.
 HDD is the internal Hard Disk Drive.
 USB: Any USB device connected to the front of the 816-HD
 SD: Reserved for future development.

Function: Options: Fast Format; Slow Format (Not available for SD/USB Format)

UPGRADE

NOTE: It is essential that the upgrade procedure be thoroughly understood before being implemented.

Options: FIRMWARE / MCU / CP3 MCU.

FIRMWARE. This is the firmware for the 816-HD.

MCU. System Software. Currently this upgrade is not available for use for installed systems and can only be applied at a Gatekeeper Systems facility.

CP3 MCU This update is for the optional extra ICD (Interactive Control Display).

Default: FIRMWARE

Important: When updating firmware on a GSI 816-HD system ONLY use the approved and up to date firmware. Once the firmware has been successfully updated, the system will automatically restart. It is essential for this restart to take place. Once a firmware update and configuration has been loaded into the DVR, the configuration must be checked for correctness. If discrepancies are found the necessary changes must be manually made to the configuration.

1. Log In to The Gate section of www.gatekeeper-systems.com and download the correct firmware for the GSI 816-HD system. Please refer to the appropriate firmware "Release Notes" for specific file information.
2. Save this file to a USB Storage Device. The file must be saved to a folder named dvrupgrade. DO NOT place the firmware anywhere else or the upgrade will fail. The file will be in a .sw format and should not be renamed or changed in any way.
3. Double check that the file name of the downloaded firmware has not been changed by the internet browser. If additional characters such as brackets or numbers have been added, manually remove these from the file name.
4. Go to the recorder on the vehicle. Connect a portable monitor (or ICD Assembly) to the GSI 816-HD system. Turn the bus ignition on. This should power the unit on automatically.
5. Using the remote control or ICD, enter the user name and password. Refer to technical documentation for username and password information.
6. Insert the USB Storage Device into the front of the GSI 816-HD unit.
7. Using the arrow buttons, go to the System Settings > Config > Export Config > Are You Sure You Want to Export Local Config (select yes). If this is successful, a window will appear that states "Export Success". The config will now be saved to the USB Storage Device.
8. Using the arrow buttons, go to "System Settings > Upgrade".
9. Arrow down to "Upgrade" and select ENTER. If you see the message "No External Storage", reseal the USB Storage Device and try again. During the upgrade the LED's on the front of the unit will flash all at once for approximately 3



seconds and then go out. This pattern of flashes will repeat until the update is completed. The upgrade may take several minutes.

10. Once the upgrade has been completed, press EXIT on the remote until you see the unit restarting. At this point, the 816-HD will restart automatically.
11. Once the system has restarted, go to System Settings > Config > Import. Confirm the import and wait for the message stating "Import successful". Exit the system menus and the unit will need to restart once again.
12. Once the unit is restarted, check to ensure that all video channels are still functioning. To check the firmware version, use the arrow buttons and go to System Settings > Upgrade and check the "Current Version".

USER SECURITY

Sets the security level for various users. The Password Must be Eight characters/digits.

Please Note: If the Administrator password is Forgotten/Lost retrieval requires a call to Gatekeeper Systems technical support for reset.

User ID:	Factory default is 0.
Password Enable	Options: ON / OFF
User Level	Options: Administrator/Power User/User
Password	Enter the required new Eight character password.
Confirm	Enter the same password exactly as entered in the previous Password input box. Please Note: When the Password has been entered and prior to the Confirm password being entered an error message will display stating Password Inconsistent. This message will remain until the confirm password box has been completed and the OK button at the bottom of the screen has been selected.
USER	When set to ON and USER enters their password the only menu options available are Recorded Video and System Information.
POWER USER	When set to ON and POWER USER enters their password the Menu entries under SYSTEM: (FORMAT/USER SECURITY/SYSTEM LOG) will not be available to POWER USER. All other menu options will be available.
ADMINISTRATOR	Has full control over all aspects of the system.

CONFIG.

Within the Config menu there are options to Reset to Default; Export the current configuration and Import a previously saved configuration from another 816-HD.

DEFAULT:	Restores the 816-HD to factory default settings.
RESET ALL HISTORY INFO.	Resets all History. No History information remains after selecting this option and Pressing YES on the confirmation window.
EXPORT:	Exports the current configuration. Use a USB drive connected to the front of the 816-HD to download Export the configuration to. The configuration file name will be saved as MDVRCFG.CFG This file name MUST not be changed or any 816-HD which you attempt to Import this configuration to will not see the file.
IMPORT:	Imports a previously saved configuration from another 816-HD. Use a USB drive connected to the front of the 816-HD for the Importing of the configuration file.

Config dialog window displays options regarding the configuration files of the 816HD.



Figure 9: Config Screen



SYSTEM LOG

Within System Log there are two options; Export System Log and Delete System Log.

- Export System Log: Exports the System log to an external USB drive connected to the front of the 816-HD.
- Delete System Log: Deletes the System Log. If selected a confirmation window will appear.

GEO FENCING

Reserved for Future development.

RECORD.

There are Two pages of options within the Record Options menu.

OPTIONS 1		OPTIONS 2	
VIDEO TYPE	NTSC	METADATA CAPTURE	ON
RECORD MODE	GENERAL	MIRROR SD CARD POSITION	EXTERNAL
NORMAL REC RATE	NORMAL	MIRROR REC. TO SD CARD	MAIN
RECORD FILE TIME (MIN)	15	HDD/SD OVERWRITE	ON
ALARM DURATION (3-30) SEC	10	LOCKED FILE RETENTION (DAY)	10
ALARM POST REC(0-1800)SEC	0010	PRE-RECORDING SWITCH	ON
BUZZER TIME (SEC)	15	ALARM PRE-REC. TIME(1-60)MIN	10
NEXT PAGE SAVE EXIT		FRONT PAGE SAVE EXIT	

Figure 10: Record Settings.

OPTIONS 1.

- Video Type Options: NTSC or PAL Default: NTSC
- Record Mode Options: General; Timer or Event. Default: General
 - General: The 816-HD will begin recording upon power up.
 - Timer: The 816-HD will begin recording at the time specified in the Timer Record menu based on the schedule
 - Event: When an Event has been triggered the 816-HD will record. To set an Event to record go to System Settings → Event to set triggers.
- Normal Rec Rate Options: Normal or I Frame. Default: Normal
 - Normal The 816-HD will begin to record according to the configuration of the settings in the Record Setting menu.
 - I Frame The 816-HD will begin recording at 1 frame per second to conserve disk space, however, if an event is triggered the 816-HD will record at the frame rate specified within the Record Setting menu.
- RECORD FILE TIME (MIN) Sets the length in minutes of the recorded video file. This cannot currently be changed from the default of 15 minutes.
- ALARM DURATION Determines the duration for which an Alarm will record.
- ALARM POST REC Determines the duration for how long an Alarm will record for after it has been activated.
- BUZZER TIME{SEC} Can be set to 15, 30, 45, 60 or Always.



CAMERA SETTINGS

Camera Setting options controls what will be displayed on the On Screen Display and/or what will be recorded. The Enable value can either be ON or OFF. If the CAMERA value is set to ON the text entered into the NAME field will display on the OSD.

If Audio is set to ON recorded video will have associated audio recorded with that video.

Live controls whether specific channels Video/Audio will be available using Live View.

IP Intercom is currently reserved for future development.

It is recommended that LIVE AUDIO be left at its default value of OFF.

NEXT PAGE Displays options for CAMERAS 9 through 16.

CAMERA SETTINGS				
CAMERA	ENABLE	NAME	AUDIO	LIVE
CH1	ON	12345678	ON	ON
CH2	ON		ON	ON
CH3	ON		ON	ON
CH4	ON		ON	ON
CH5	ON		ON	ON
CH6	ON		ON	ON
CH7	ON		ON	ON
CH8	ON		ON	ON
ROUND:		OFF	ROUND TIME: 120 (5-300)SEC	
IP INTERCOM:		ON	LIVE AUDIO: OFF	
		NEXT PAGE	SAVE	EXIT

Figure 11: Camera Settings.

RECORD SETTING.

RES Options D1 704×480
HD1 704×240
CIF 352×240

FPS Options 1 - 30. The maximum frame rate available is dependent upon the RES setting. With 16 cameras at D1 maximum frame rate is 15 FPS

Normal Quality Options 1 - 8. 1 is best quality.

Alarm Quality Options 1 - 8. 1 is best quality. Alarm is for Alarm recordings

RECORD SETTINGS				
CAMERA	COMMON PARA		NORMAL	ALARM
	RES	FR	QUALITY	QUALITY
CH1	D1	10	2	1
CH2	D1	10	2	1
CH3	D1	10	2	1
CH4	D1	10	2	1
CH5	D1	10	2	1
CH6	D1	10	2	1
CH7	D1	10	2	1
CH8	D1	10	2	1
		NEXT PAGE	SAVE	EXIT

NEXT PAGE Gives Record Settings Options for Cameras 9 through 16.



MIRROR RECORD SETTINGS.

Mirror Record Settings allows for backing up from the COMRAD™ to the SD card. Due to the potential Gigabyte size difference between the COMRAD™ and SD card specific channels can be chosen to backup.

For example, if STOP ARM recordings are to be backed up and Channel 3 has been set to be the Stop Arm camera, then Channel 3 should be set to ON in Mirror Record Settings and all other channels set to OFF. This will ensure maximum amount of disk space on the SD card to be available for Mirroring.

A maximum of 8 channels can be set to mirror to the SD card.

MIRROR RECORD SETTINGS

MIRROR RECORD MAX CHANNEL : 8

CAMERA	ENABLE	CAMERA	ENABLE
CH1	ON ▼	CH9	OFF ▼
CH2	ON ▼	CH10	OFF ▼
CH3	ON ▼	CH11	OFF ▼
CH4	ON ▼	CH12	OFF ▼
CH5	ON ▼	CH13	OFF ▼
CH6	ON ▼	CH14	OFF ▼
CH7	ON ▼	CH15	OFF ▼
CH8	ON ▼	CH16	OFF ▼

SAVE
EXIT

SUB STREAM

RESERVED FOR FUTURE DEVELOPMENT.

SCHEDULE

	DATE	OPTIONS:	Single Day:	Select a day of the week for the schedule to run.
			EVERY:	Applies a schedule to every day of the week
			WKD:	Runs the schedule based on the days selected in Workday From
			*****:	Suspends the selected schedule.
	SCHEDULE 1	00:00-00:00		Input the Start Time and End time for the scheduled recording.
	TYPE	OPTIONS:	BD:	Reserved for future development.
			MD:	Reserved for future development.
			NORMAL:	The 816-HD will record as normal.
			ALARM:	The 816-HD will record Events ONLY during the time specified in the schedule.
	SCHEDULE 2	00:00-00:00		This defines the schedule for a second cycle on the same day if required.
	TYPE	OPTIONS:	BD:	Reserved for future development.
			MD:	Reserved for future development.
			NORMAL:	The 816-HD will record as normal.
			ALARM:	The 816-HD will record Events ONLY during the time specified in the schedule.



WORKDAY
FROM

OPTIONS:

SUN; MON;
TUE; WED;
THU; FRI;
SAT.

Select the days to START and END a schedule.

OTHER SETTING

INITIALIZE INTERFACE

Options:

Liveview/CP3 MENU

Liveview is utilized when a portable device such as a DVD player is connected to either of the AV Out connectors; (1) Front of the 816-HD and (2) as part of the DB44 cable (camera fly lead) for initial setup and configuration.

CP3 is an internal name for the ICD which is an accessory available from Gatekeeper Systems, also used for initial setup and configuration.

Disabled.

WATERMARK

INTERCOM SENSOR

Options:

OFF / SENSOR1 / SENSOR2 /
SENSOR3 / SENSOR4 / SENSOR5 /
SENSOR6 / SENSOR7/SENSOR8

This feature is reserved for future development.

EXPORT MINI PLAYER

Exports the Mini Player application to an attached USB drive.





NETWORK

The NETWORK menu is sub-divided into Five sub-menu's; LOCAL; SERVER; WIFI; MOBILE NETWORK and FTP SETTINGS. Each of these sub-menu's are configurable by the user.

LOCAL

Local settings are used to allow the 816-HD to have network connectivity either through an external wi-fi module, or, direct connection to a network switch/hub.

Please consult with your I.T. department for all required information relating to IP; DNS Server, etc. if connecting the 816-HD directly to a network

1. IP. This is the IP Address for which the 816-HD has been pre-configured.
2. SUB. The subnet the 816-HD will be using.
3. GATE. When an external Wi-Fi module is being utilized, Gateway address has been pre-configured to allow communication between the 816-HD and the network.
4. Client Port and Web Port. These are the ports which will be need to be opened to allow communication of the 816-HD to the network.
5. DNS. Allows communication between the 816-HD and the host network.
6. MAC Address. The MAC address of the 816-HD

LOCAL NETWORK

IP TYPE:

IP:

SUB:

GATE:

CLIENT PORT:

WEB PORT:

DNS SERVER:

MAC ADDRESS: 00-18-F5-09-B8-94

Figure 12: Local Network Settings.

SERVER

The IP address' shown are for example only. Please consult with your I.T. department for all required information relating to IP; DNS Server, etc.

CENTER SERVER 1

OPTIONS	Cable Net	Select this option when a CAT5/6 cable is directly connected from a PC/Server to the 816-HD, or, when using an external Wi-Fi radio.
	Mobile Net	Allows connection to the 816-HD via 2G/3G cellular networks.
	Wi-Fi Net	Select this value when the 816-HD is going to use the internal Wi-Fi module for communications.

MESSAGE SERVER

OPTIONS	Domain Name	If a fully qualified domain name is available, this option can be utilized. Enter the FQDN in the text entry box below this option.
	Static IP	If a dedicated IP address can be assigned this option can be selected. If this option is selected enter the IP address of the server in the text box below. The IP address must use all digits contained within the octet. For example, if the server has an IP address of 10.5.0.100 the digits entered into the IP address text box would be in the following format: 010.005.000.100

PORT This should be left at its default value.



MEDIA SERVER

- OPTIONS**
- Domain Name If a fully qualified domain name is available, this option can be utilized. Enter the FQDN in the text entry box below this option.
 - Static IP If a dedicated IP address can be assigned this option can be selected. If this option is selected enter the IP address of the server in the text box below. The IP address must use all digits contained within the octet. For example, if the server has an IP address of 10.5.0.100 the digits entered into the IP address text box would be in the following format: 010.005.000.100
- PORT** This should be left at its default value.

The IP address' shown are for example only. Please consult with your I.T. department for all required information relating to IP; DNS Server, etc.

CENTER SERVER 2

- OPTIONS**
- Cable Net Select this option when a CAT5/6 cable is directly connected from a PC/Server to the 816-HD, or, when using an external Wi-Fi radio.
 - Mobile Net Allows connection to the 816-HD via 2G/3G cellular networks.
 - Wi-Fi Net Select this value when the 816-HD is going to use the internal Wi-Fi module for communications.

MESSAGE SERVER

- OPTIONS**
- Domain Name If a fully qualified domain name is available, this option can be utilized. Enter the FQDN in the text entry box below this option.
 - Static IP If a dedicated IP address can be assigned this option can be selected. If this option is selected enter the IP address of the server in the text box below. The IP address must use all digits contained within the octet. For example, if the server has an IP address of 10.5.0.100 the digits entered into the IP address text box would be in the following format: 010.005.000.100
- PORT** This should be left at its default value.

MEDIA SERVER

- OPTIONS**
- Domain Name If a fully qualified domain name is available, this option can be utilized. Enter the FQDN in the text entry box below this option.
 - Static IP If a dedicated IP address can be assigned this option can be selected. If this option is selected enter the IP address of the server in the text box below. The IP address must use all digits contained within the octet. For example, if the server has an IP address of 10.5.0.100 the digits entered into the IP address text box would be in the following format: 010.005.000.100
- PORT** This should be left at its default value.



WIFI

Wi-Fi can be configured for use of an internal Wi-Fi card, if installed, or for when an external Wi-Fi radio is being utilized. If an external Wi-Fi radio is being used Wi-Fi ENABLE must be set to OFF.

If an internal wireless module is being utilized, please consult with your Information Technology department for all relevant IP; DNS; Gateway and subnet information.

If Wi-Fi is enabled, I.E. using an internal Wi-Fi card, there are two options once enable has been selected:

Client: Sets the 816-HD as a client on the network. Once selected GET IP Type will become available with two options; Static IP and Dynamic IP.

If Static is chosen complete the required fields for IP; SUB; and Gateway.

ESSID: ESSID only becomes active once the PASSWORD ENABLE option has been chosen. Enter the required ESSID, network name, for the wireless network.

Figure 13: Wi-Fi Settings.

PASSWORD ENABLE

Options: NONE/WEP/WPA

MOBILE NETWORK.

Please note: This function is currently reserved for future development.

If a mobile network is to be configured, the 816-HD will require the installation of a SIM card, this must be done at time of purchase of the 816-HD from Gatekeeper Systems as disassembly of the 816-HD in the field will void the warranty.

Module Type Options: NONE; CDMA; EVDO; WCDMA; EDGE; TD-SCDMA
 If EVDO is chosen, a secondary dialog window will appear with options for 2G3G / 2G / 3G.
 Default: None

Active Mode Options: Always; Call/SMS; Sensor. If Call/SMS is selected a secondary dialog window will appear where up-to three phone numbers can be entered.

Dial Parameter

Wireless module	User Name	Password	APN	Access Number
CDMA	Card	Card		#777
EVDO	Card	Card		#777
WCDMA			Check with SIM card manufacturer	*99#
GPRS			Check with SIM card manufacturer	*99***1#
EDGE			Check with SIM card manufacturer	*99***1#

Intercom Settings Reserved for future development.

FTP SETTINGS

Not Supported



EVENT.

SENSOR

Sensor setup consists of two pages of options which are user definable.

S1; S2 and S3 are pre-defined and factory defaults are set for BRK (Brakes); WRN (Warning Lights) and STPARM (Stop Arm).

S7 and S8 are currently unassigned and reserved for future development.

The OSD setting is limited to two characters.

It is recommended that SET remain at its factory defaults of HIGH.

Alarm determines if the Alarm LED will flash when the Sensor is activated.

LOCK sets if the recorded video file created by the sensor will be protected from being over-written.

On the second page of Sensor Configuration the actions which will occur when a Sensor Trigger has been activated can be set.

In the example on the right, when SENSOR 1 is activated Channel 3 will be recorded and displayed full screen on playback.

FULL SCREEN options can be set for CH1 through CH4, CH1; CH2; CH3; CH4 or NONE.

ALARM OUTPUT

THIS FEATURE IS CURRENTLY NOT SUPPORTED.

SENSOR						
NO	ENABLE	NAME	OSD	SET	ALARM	LOCK
S1	ON	BRK	BK	HIGH	ON	OFF
S2	ON	WRN	WN	HIGH	ON	OFF
S3	ON	STPARM	SA	HIGH	ON	OFF
S4	ON	DOOR	DR	HIGH	ON	OFF
S5	ON	LTRN	LT	HIGH	ON	OFF
S6	ON	RTRN	RT	HIGH	ON	OFF
S7	ON		7	HIGH	OFF	
S8	ON		8	HIGH	OFF	

SENSOR TRIGGER ACTION		
NO.	FULL SCREEN	3G ACT.
S1	CH3	OFF
S2	NONE	OFF
S3	NONE	OFF

Figure 14: Sensor Settings/Actions.



SPEED

There are numerous options available for setting within the Speed option. Some of these options are only available after other selections have been made. **Please Note:** An approved GPS antenna is required for the 816-HD to receive satellite signals for speed.

Once the SPEED menu has been accessed, Speed Source can be selected as either Vehicle or GPS. If Vehicle is selected please consult the documentation which came with your vehicle to see how to set up this connection.

If an approved GPS module has been fitted select GPS as the Speed Source.

Speed Unit can be set to either MPH or KPH, select the correct Speed Unit for your location.

To enable Speed check select the Enable menu and set to ON.

Next for either LOWSPEED or OVERSPEED set the THRESHOLD value. Use the Numeric keypad on the remote control to set the required values.

To have an Alarm be registered when the THRESHOLD value has been reached or exceeded, set the ALARM option to ON.

Once all selections have been made, highlight the OK button and press ENTER on the remote control.

NAME	OSD	ENABLE	THRESHOLD	ALARM	LOCK
LOW SPEED	SPDL	OFF	010	OFF	OFF
OVERSPEED	SPDO	OFF	100	OFF	OFF

Figure 15: Speed.

ACCELERATION.

The 816-HD has been fitted with an internal Inertia, G, Sensor. This can be setup with independent values for X, Y and Z axis, these can be set to the requirements of the individual customer.

The Inertia sensor can be setup by accessing System → Event → Acceleration.

To enable select ON from the OVERSHOCK SHK drop down box. Enter the relevant values.

If there's a requirement for an arm to be triggered if the pre-set values have been exceeded, then change the ALARM drop down from OFF to ON.

NAME	OSD	ENABLE	THRESHOLD	ALARM	LOCK
OVERSHOCK SHK		ON	X: 5.5 G Y: 5.5 G Z: 5.5 G	OFF	OFF

X: (+)00.16 Y: (+)00.012 Z: (+)00.008

Figure 16: Acceleration.



TEMPERATURE.

If Temperature is enabled in the configuration of the 816-HD and the ALARM setting has been set to ON, the output can be viewed as part of the Device Status within G4 viewer, or, by selecting Event Files within the Recorded Video menu option.

TEMPERATURE

● TEMPERATURE UNIT:

● ENVIRONMENT TEMP. ALARM SETTINGS:

NAME	OSD	EN	THRESHOLD	ALARM	LOCK
HIGH TEMP.	HT	<input type="text" value="ON"/>	+85	<input type="text" value="OFF"/>	<input type="text" value="OFF"/>
LOW TEMP.	LT	<input type="text" value="ON"/>	-40	<input type="text" value="ON"/>	<input type="text" value="OFF"/>

CAMERA

Motion Detection and Blind are not currently supported.

With Video Loss enabled, if there is a problem with the video feed from the camera the 816-HD will detect this. With VL Enabled and Alarm set to ON when there is Video Loss detected the OSD will display an Alarm warning.

The VLOSS led on the front of the 816-HD will also be illuminated if video loss occurs. Please note that if no cameras are physically connected to the 816-HD but the corresponding channels have been Enabled, VLOSS will display on the OSD; Recorded Video, and is set, the alarm will be displayed.

CAMERA

● MOTION DETECTION SETTING:

CH ID	M.D.SENSITIVE	M.D.AREA	B.D.SENSITIVE
<input type="text" value="1"/>	<input type="text" value="3"/>	<input type="button" value="SETUP"/>	<input type="text" value="1"/>

● ALARM SETTING:

NAME	OSD	ENABLE	ALARM	LOCK
BLIND	BD	<input type="text" value="OFF"/>	<input type="text" value="OFF"/>	<input type="text" value="OFF"/>
MOTION	MD	<input type="text" value="OFF"/>	<input type="text" value="OFF"/>	<input type="text" value="OFF"/>
VIDEOLOSS	VL	<input type="text" value="ON"/>	<input type="text" value="ON"/>	

VOLTAGE

Low Voltage Protection is OFF by default. If Enabled Highs; Lows and Measurements in-between will be displayed as part of the Device Status within G4 viewer.

LOW VOLTAGE PROTECTION

ENABLE:

LOW VOLTAGE: V

VOLTAGE OF START: V

INTERVAL FOR CMS: MIN

SHUT DOWN DELAY: MIN

EMERGENCY EVENT.

Determines if the Driver Alert Button will activate an alarm when pressed by the driver of the vehicle. If Alarm is set to ON a marker will appear as part of the OSD and video playback file. EXT.COM must also be configured for Emergency Event to be recorded.

LOCK sets if the video file produced will be overwritten when the COMRAD™ has reached its capacity.

EMERGENCY EVENT

● CONFIG. OF PANIC BUTTON:

NAME	ENABLE	ALARM	LOCK
	<input type="text" value="ON"/>	<input type="text" value="ON"/>	<input type="text" value="OFF"/>

Figure 17: Emergency Event.



FATIGUE DRIVING.

THIS FEATURE IS CURRENTLY NOT SUPPORTED.

PERIPHERAL

PTZ

Reserved for future development.

EXT. COM

COM1 and COM2 are reserved for RS232 connections and are currently not supported.

If a Driver Alert Button is to be utilized, COM3 should be set to CONTROL PANEL and MODE set to BUS MODE.



SYSTEM INFORMATION.

There are Three sub-menu's listed under the System Information Menu. System; History; Modules.

SYSTEM

In the System sub menu the System Info dialog box will display relevant information in regards to the firmware version currently installed on the 816HD.

HDD/SD information will also be displayed and this will show the total size of the HDD and the amount of disk space remaining.

Once this information has been viewed highlight and select the OK button to return back to the menu.



Figure 18: System Info.



HISTORY

The History informational page is divided into Three separate dialog windows.

History dialog box Page One display's the Highest Speed recorded by the vehicle and also the Total Mileage since the last time this value was cleared.

To Clear a value use the remote control to highlight the word Clear to the Right of the relevant section and then press Enter on the remote control.



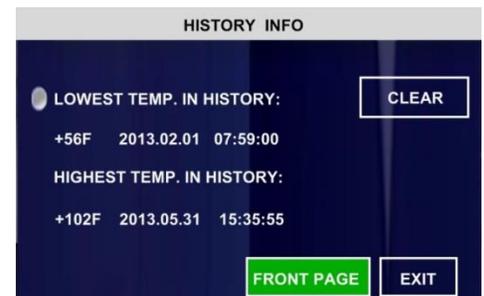
History dialog box Page Two display's the Highest Shock as registered by the vehicle and also the Lowest Voltage since the last time this value was cleared.

To Clear a value use the remote control to highlight the word Clear to the Right of the relevant section and then press Enter on the remote control.



History dialog box Page Three display's the Highest and Lowest Temperature as registered by the vehicle since the last time this value was cleared.

To Clear a value use the remote control to highlight the word Clear to the Right of the relevant section and then press Enter on the remote control.



MODULES

Modules displays system status information in regards to additional hardware, I.E. GPS and WIFI Modules

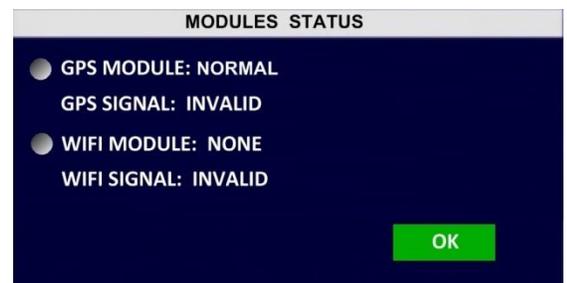


Figure 19: Modules.



G4 Incident Management Software Overview.

G4 viewer is compatible with Microsoft Vista; Microsoft Windows 7 and Microsoft Windows 8. Microsoft XP is not supported as Microsoft has deemed it to be End-Of-Life.

Gatekeeper Systems G4 Incident Management Software offers un-paralleled video management with the added functionality of image blurring. Targeted areas of the recorded video can be selected and marked as Blurred, ensuring anonymity of bystanders. Clips can be saved locally, as AVI, or, exported with a stand-alone mini-player. Video can be viewed by File List or by Event List making finding an incident easier than ever before.

INSTALLATION.

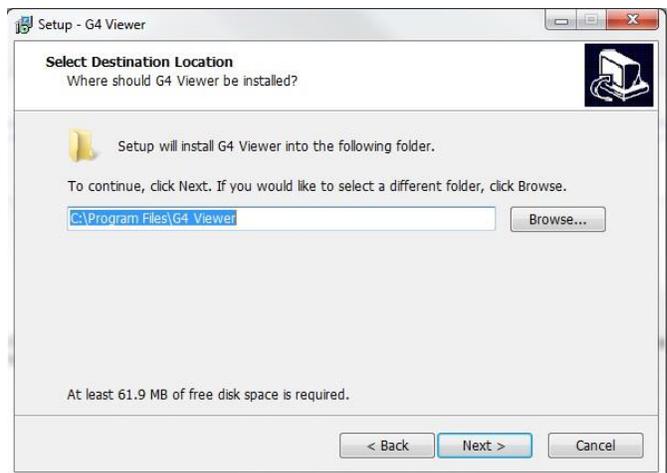
PLEASE NOTE: The installation of G4 Viewer must be completed with Administrator rights. For more information on this, please speak with your School District's Information Technology contact.

This section will describe how to install Gatekeeper Systems Inc. G4 Incident Management Software. Please read before beginning the install. G4 Incident Management Software can be installed from the G4 CD (available as part of G4-BXXHDDLK), or, as a free download from The Gate area of www.gatekeeper-systems.com

To begin the installation of the G4 viewer from gatekeeper Systems Inc. double click on the G4_Viewer_XXXX.exe file (where XXXX = the version number). Set up will now begin.



Accept the default location for the program install. Click Next.





In the window which appears next make sure that “Don't create a Start Menu Folder” is not checked.

Click Next.

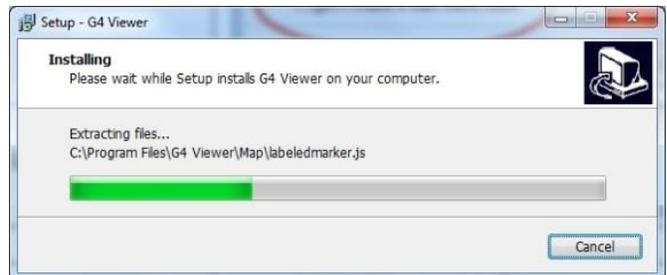


Select “Create a Desktop Icon” and click Next.

A window stating Ready To Install will appear, click on Install.



An Install Progress window will appear.



Once Setup has completed the Completing The G4 Viewer Setup Wizard will appear.

Ensure Launch G4 Viewer is selected and click on Finish.



G4 Icon will now be placed upon the desktop.





G4 Incident Management Software Interface.

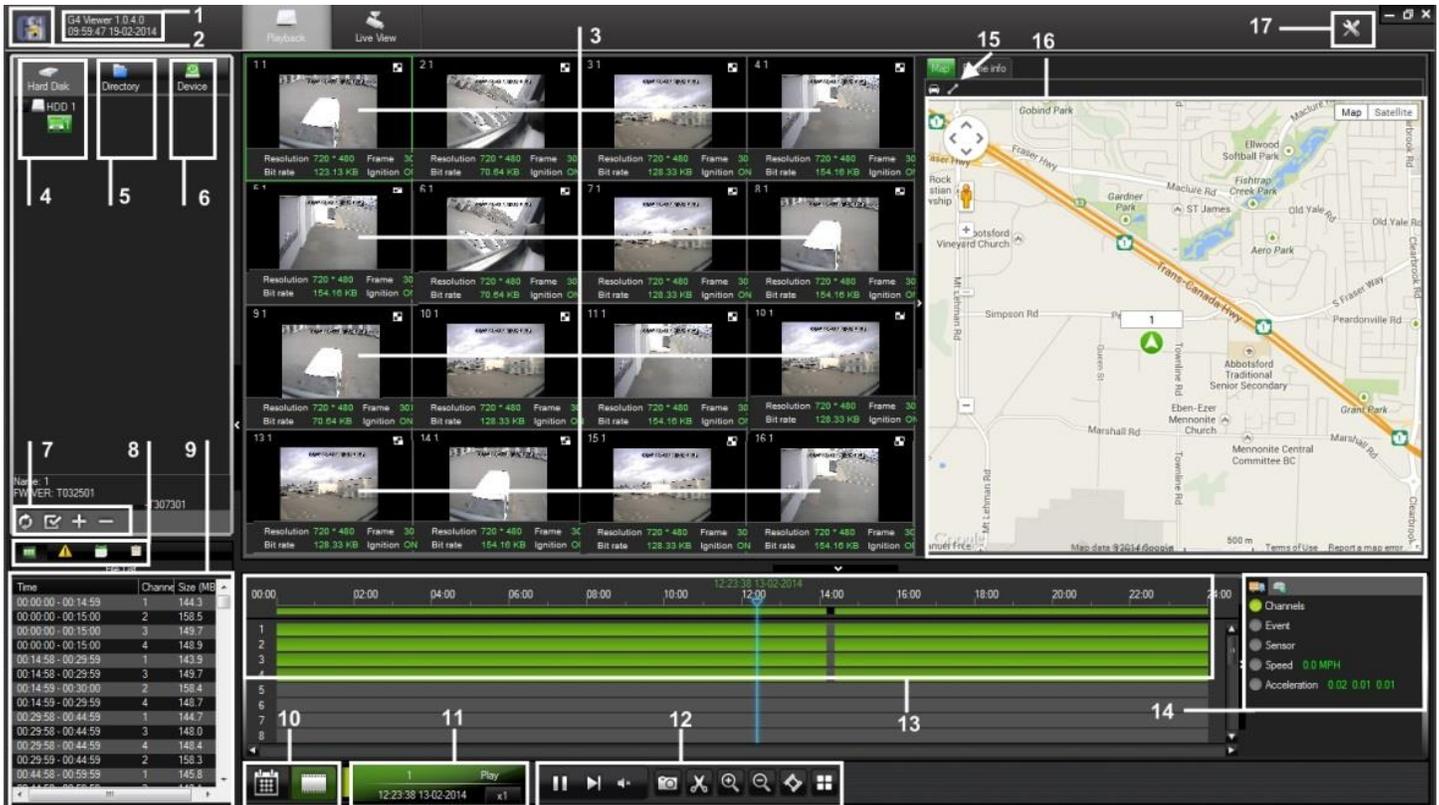


Figure 20: G4 Incident Management Software Interface.

1. Displays the installed version of G4; Current System Date/Time.
2. GSI Logo. When Clicked opens www.gatekeeper-systems.com
3. Video Playback Window,
4. HDD. Becomes active when a COMRAD™ is detected on the system.
Please Note: When using a COMRAD™ HDD from a 816-HD in a Microsoft Windows based system, you will be prompted to format the COMRAD™, Click CANCEL. If you choose to format the COMRAD™ ALL VIDEO will be deleted from the COMRAD™.
5. Directory. Displays all files clipped from a COMRAD™ and saved to that directory.
6. Device. Used in conjunction with a Gatekeeper Systems Wireless System.
7. Displays options based on which view is currently active.
8. Playback File Options. Use to select from File List; Event List; Log; Search.
9. Video Clip Information Panel.
10. Calendar/Playback interface selector.
11. File Playback Information and Playback Speed adjustment.
12. Playback/Clip Controls.
13. Time Bar.
14. Vehicle Status Panel. View information on Channels; Events; Sensor; Speed and Acceleration.
15. GPS Vehicle lock; Route Tracer options.
16. GPS Map.
17. Settings. Use to set default directory for snapshots, Unit Setup Options and Record Options.



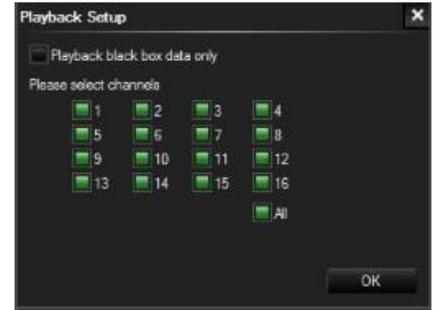
Using G4 Incident Management Software.

HDD

When viewing recorded video from a 816-HD using the COMRAD™, Hard Disk will display a single item listed below HDD1, this is also true if the COMRAD™ has Two hard drives fitted internally. Double click on the highlighted COMRAD™ and all available video on the COMRAD™ will be displayed in the Calendar. Double click on one of the highlighted days and the Playback Setup dialog window will appear.



Once a date has been selected for playback a pop-up window will appear. If Playback Black Box Data Only is selected only the GPS map with vehicle and route tracer will display in the Video Playback window, item 3 in Figure 20.



In the pop-up window select the required channels for playback, or, select ALL to playback all 16 channels and then click OK.

Video will now begin playing in the video playback window.

Directory.

The Directory contains all of the previously Clipped video. Once a clip has been made the Directory automatically updates to reflect the new clip name and location if the clip is from a new vehicle.

If the clip is from a vehicle which has an existing entry in the directory, when the vehicle name is double clicked the Calendar view will display all available clips for that vehicle. If all video clips are going to be stored in the same folder location, a Default Directory location can be set.



To set a default directory Highlight the required Directory and then click the "Set it as the Default Directory" Icon [1 in the image to the right]. A confirmation dialog box will appear. If this information is correct click the OK button.



To add a directory click on the + Icon [2 in the image to the right] and navigate to a directory. This directory MUST have the correct structure in terms of containing the rmdvrrootdir.dat file which points to a previously clipped file.



Device.

Device lists all the 816-HD's which have been configured to utilize Gatekeeper Systems Inc. MeteorMax Wireless System. This setup and configuration is covered in more depth in a separate document.

Opening Screen.

When G4 Viewer is first launched and a video clip has been selected, the opening screen will display these four initial icons.

1. File List. Allows the video files to be selected in chronological order.
2. Event List. Display available events for playback. Events displayed are Time / Type / Name, e.g. BK; WN / Information, e.g. Sensor 1; Sensor 2.
3. Log. Displays Logged information. [Reserved for future development].
4. Search. See Figure 22 for more information.



Figure 21: Opening Screen Icons.

Once a video has been selected and playback has begun, it is possible to search by specific criteria. Click on the Search button just below the Search Icon (#4 in Figure 21). This will launch the Filter Settings dialog window.

1. Enter the required Start and End time of the Search.
2. Select the required items to be included in the Search.
3. Once criteria has been set click on the Search button.



Figure 22: Search Filter.

The Search will now begin and results will be displayed in the results window.

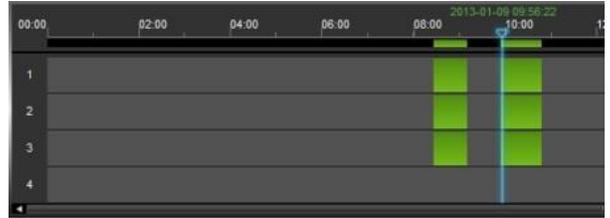
In this example Sensor2 had 3 Events during the specified time period, denoted by (3). Click on the Plus sign to the left of the Result and the window will expand showing information regarding what happened at that time. If you now double click on an entry, e.g. 08:20:37 22-11-2012 the video in the playback window will jump to that specified portion of the video file.





Time Bar.

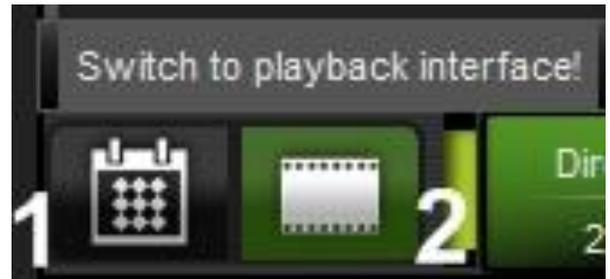
The Time Bar (item 13 in Figure 20) displays the current day's video files in chronological order. If there is a break in the time line this denotes that there is no video available for playback during that time frame. In the example on the right, there are only two video files for the vehicle's morning run, these are shown as GREEN in the Time Bar. If the 816-HD has been set up for recording Alarms, the video files available will be displayed as RED.



Calendar or Playback Interface.

Calendar/Playback Interface selector (item 10 in Figure 20) is used to select either 1 Search Interface, or, 2 Switch to Playback Interface.

If Search Interface is selected the Video Playback window will close and be replaced with a Calendar with dates with video files available highlighted.



Playback Details.

Playback Details displays information about the currently playing Video file. The Bus Name from where the video file has been loaded is located top left of Playback Details. Top right shows current state of the Video file and will display Play if the video is actively being played. PAUSE if the video has been paused. The DATE of the video file will be displayed as well as the current location of the Playback Indicator. Bottom right shows the current playback speed of the video file. See Figure 23 for playback controls.



Playback Controls.

The Playback Controls consist of three items; Play (or Pause dependent upon the state of the currently playing video file).

Next Frame. When the video file has been paused this allows the video to be advanced in One frame increments. This feature gives the ability for exact incident capture, e.g.

License Plate Capturing.

The Speaker Icon allows for volume adjustment, or, mute.

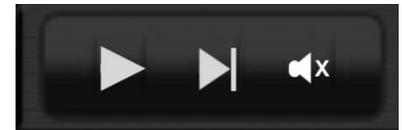


Figure 23: Playback Controls.



Snapshot / Clip / Open File / Layout Controls.

With the video paused at a specific image, if the Snapshot (Camera) Icon is clicked a snapshot will be sent to the folder previously setup in System Setting (Item 17 in Figure 20). To the right is a pop up menu with an option to Open Folder, this will open the folder to which the snapshot has been saved.



If the Clip (scissors) icon is clicked the Time Line window will display an option window, see Saving a Clip, Page 44.



The Zoom-In Icon will zoom in on the time line status window, e.g. if a clip shows 1 hour when zoomed in the time line can show individual seconds of the current video playback.



The Zoom-Out icon is the reverse of Zoom-In.



Open File. This allows navigation to a known folder containing 816-HD H.264 video files and selecting them for playback. Note only one of the files in the folder in question needs to be highlighted and selected for all of the files in that folder to be played back,



Layout. When clicked a secondary pop-up window (See Figure 24) will appear giving various options as to how the currently playing video file will be played back.



Figure 24: Playback Window Layout Options.

System Settings.

Under System Settings the default directory for Snapshots can be set.

1. Allows a password to be set. Please note if this password is forgotten, future changes cannot be made without uninstalling G4 viewer and cleaning the registry.
2. The location of the default directory. Use the Ellipse button ... to navigate to the desired folder. It is recommended that this folder be created prior to setting the path.
3. Unit Setup. Choose between MPH; KPH and C; F.

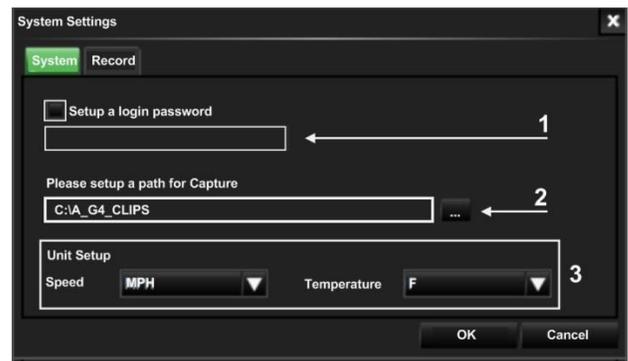


Figure 25: System Settings.

Once settings have been made/changed there will be a need to restart G4 Viewer.



Playing Back a Video File.

To playback a video file, open G4 Incident Management Software in Calendar View and from the HDD or Directory listing double-click on an available vehicle ID. This will bring up all dates for that vehicle for which there are available videos. If the dates are highlighted in Green this indicates that video is available but no Sensor/Event activity occurred. If the date is highlighted in Red this indicates that Sensor/Event activity has been registered by the 816-HD.

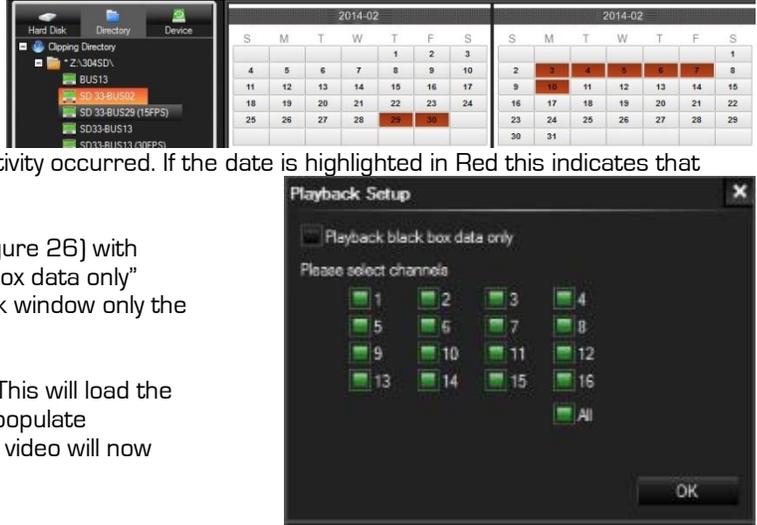


Figure 26: Playback Setup.

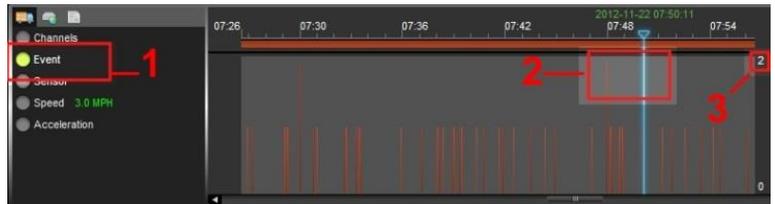
Double-click on the Date and a dialog window will appear (Figure 26) with options displaying available channels. If the “Playback black box data only” check box is selected and OK is clicked, in the Video Playback window only the GPS map and Vehicle Route.

Select the required channels to playback and then click OK. This will load the video into the Video Playback window and the Time Line will populate displaying the start time of the recorded video. The selected video will now begin playing.

Event Playback.

With Viewer it is possible to view Events; Sensor or Speed Playback by viewing the Time Bar.

If Event playback (1) has been Selected, the Time Bar will display all Events captured during the vehicle route. If an individual Event is selected (2) the playback video will jump to that position and the Event list window will highlight the current Event selection. The Event number, as set up in the 816-HD configuration, will also be displayed, (3).



Sensor / Alarm Playback 1.

When an 816-HD has been set up to record Sensor / Alarm activations, these will show in G4 Incident Management Software.

In Figure 27 the SA, Stop Arm, event timed at 06:33:35 has been Double-Clicked (1) the Time Bar is immediately updated with the file for playback relating to this time (2).

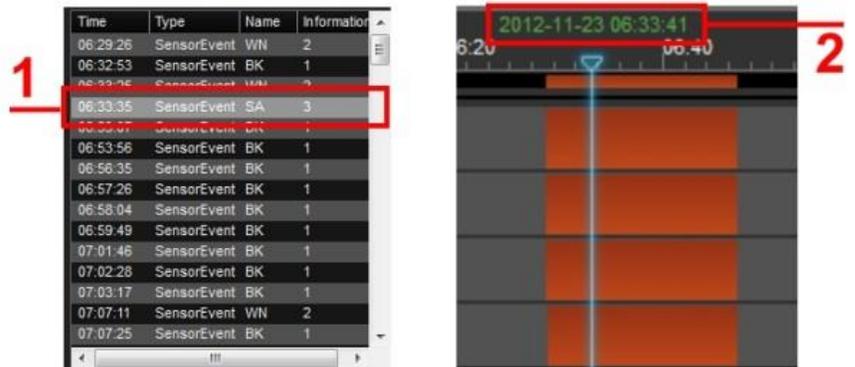


Figure 27: Playback Sensor/Alarm Activations.



Sensor / Alarm Playback 2.

In playback Mode it is also possible to have the Time Bar just display Sensor markers rather than All Channels.

If Sensor (Item 14 in Figure 20) is selected the Time Bar will display Markers for when a Sensor was activated. Use the Zoom in tool to expand the Time Bar making it easier to select an individual Sensor Marker.

When this marker is clicked the Time Bar is immediately updated with the file for playback relating to this Sensor Marker.



Vehicle Speed Playback.

If Speed is selected from the vehicle status panel the Time Bar will show the Lowest and Highest speed of the vehicle during the trip. In the example in Figure 28 the highest speed was 43.0MPH as shown on the right hand side. The current speed of the vehicle in the video playback window is shown as 36.0 MPH in a box just below the Highest speed recorded. The current speed of the vehicle in the playback window will fluctuate with this box moving up and down the column matching the peaks and troughs of the Green indicators in the Time Bar.



Figure 28: Speed Playback.

Clips.

Using G4 Incident Management Software a selection of video can be saved as a clip; exported as a standalone .exe file which includes a mini-player, or, as AVI's playable by Windows media player. Please note that AVI's generated will be individual camera views and will not contain GPS, Speed Information, etc.

Saving a Clip

When saving a clips it is recommended that a folder be created, e.g. C:\MyClips, and an initial clip saved to this location. Once this is completed in G4 Incident Management make this folder the default by clicking on the Check Mark icon (in Item 7 Figure 20).

When a clip is created a file called rmdvrrootdir.dat is created outside of the Bus Name folder and this file contains information regarding the location of the clip entries.

1. Once the Play indicator is at the required time for the clip, click on the Scissors icon in the Playback Controls panel.



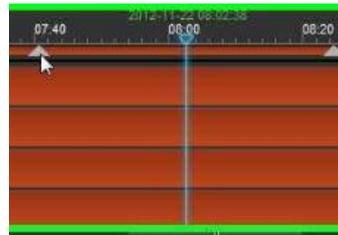


2. Click on the Zoom in Time Bar icon until a suitable time frame appears.



3. Select the Start Point and Click and Drag it to the required Start point before the required clip.

Next select the End Point and Click and Drag this to the end of the required clip.



Start Point



End Point

4. Once the desired length of clip has been set, Click on the \checkmark to the right of the Time Bar. This will confirm the clip length.



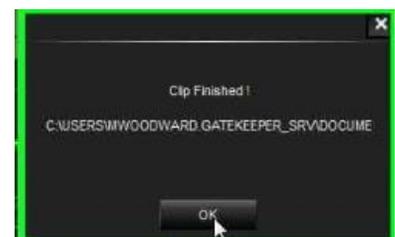
5. Once the \checkmark has been selected a confirmation window will appear showing: The clip Length (1); Required Video Channels (2); Video Clip Directory (3). Ensure that this information is correct.

It is possible to change the Start Time and End Time by manually editing these values. If this clip is to go to a directory other than the Default Clip directory

Make sure that CLIP (4) is highlighted and click OK. This will begin the Save process.

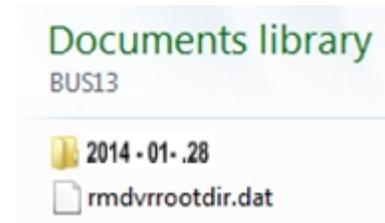


6. Once the clip has been saved a dialog window will appear. Click OK.





7. If you navigate to the folder setup in G4 System Settings, you will see a folder with the date of the clip as its title, in this example 2014-01-28: January 28th 2014.



Exporting a Clip.

When a clip is exported a standalone .exe file is created. This allows the clip to be distributed without the need to install G4 Viewer.

To Export a clip follow Steps 1, 2, 3, 4 in "Saving a Clip". In place of Clip in Step 5 of "Saving a Clip" select Export, the dialog window will change displaying additional information about the final exported file.

Click OK to begin the Export process. A Progress dialog window will appear.

Once completed a "Compressing, Please Wait" window will appear. This may show for several minutes depending upon the length of the exported file.

Once this has completed the dialog window will change stating "Clip Finished", when OK is clicked the default Folder will be automatically opened and the Exported .exe file, BUS13_20121122_135941_140912 in this example, will be available for play. The Exported file has the Vehicle Name; Date; Start Time and End Time of the exported clip.



Vehicle #	DATE	START TIME	END TIME	Name	Da
BUS13	20121122	13:59:41	14:09:12	BUS13	1/1
				BUS13_20121122_135941_140912.exe	1/1
				rmdvrrootdir.dat	1/1

Figure 29: Export File Definitions.

Export to an AVI File.

To Export a clip follow Steps 1, 2, 3, 4 in "Saving a Clip". In place of Clip in Step 5 of "Saving a Clip" select AVI.

Click OK to begin the AVI conversion process. A Progress dialog window will appear.

Once completed an "AVI Conversion" window will appear. Click OK.

The AVI file(s) will be saved in the default location as stated in System Settings.



Figure 30: AVI Conversion.



Blurring an Image.

G4 Incident Management Software has a Blur feature allowing individual elements in a video file to be effectively “screened-out” of the playback.

To Blur an area of the playback video first pause the video playback and then give a single camera the focus in the playback window.

Next click on the Blur button located at the top right-hand corner of the playback window, arrowed in the image to the right.

This will bring up the Mosaic Setting Window.



Figure 31: Blurring an Image.

The Mosaic Setting window is divided into a 20 X 20 grid.

Using the cursor click and drag to “Screen-Off” any areas you do not want to be visible in the final playback video.

Once you have defined the areas click OK to save the options.



Figure 32: Defining a Blur.

If the playback button is now clicked the playback video will display a blurred image where the blur definition was defined.

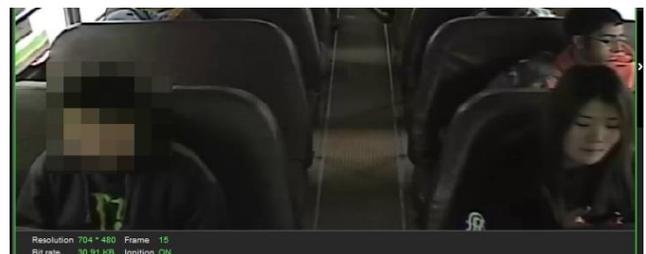


Figure 33: Playback Blur.



APPENDIX

The battery should be disconnected from the vehicle before working on the electrical system of the vehicle when installing, servicing or removing Gatekeeper products.

All Gatekeeper employees or contractors who perform electrical work (install, service or remove a DVR, installing a backup camera system for example) on a customer vehicle shall ensure that the battery in the vehicle is disconnected before work commences.

Customers shall be responsible for addressing any systems on the bus which require attention as a result of disconnecting the bus battery. This includes, but is not limited to, entering a radio theft code, programming radio stations etc.

Camera Mounting and Connections.

- Camera mounting locations are to be determined by the district.
- Cameras should be mounted to the ceiling whenever possible. Install the rubber pad provided with each camera and cut a small notch in the rubber pad to accommodate the camera cable. The audio hole on the front of the camera can be used as an aiming guide for the direction the camera needs to be facing.
- All camera harnesses must be carefully routed to the 816-HD unit to avoid pinching or piercing the shielded camera cable.
- All cables running through holes in sheet metal (ceiling, bulkhead etc.) must be protected with grommets.
- Ensure included gasket is in place between dome base plate and mounting surface.

When installing multiple cameras, mark camera harness wires so the school district knows which camera is front and back by looking at the marked Molex output connectors,

Camera Installation.

Routing the Camera Harness(es) [GSWHC2N-XX].

- Always use grommets when running the harness through sheet metal holes.
- Avoid excessively tight bends especially around metal surfaces..
- Coil and tie off excess harness in a safe place.

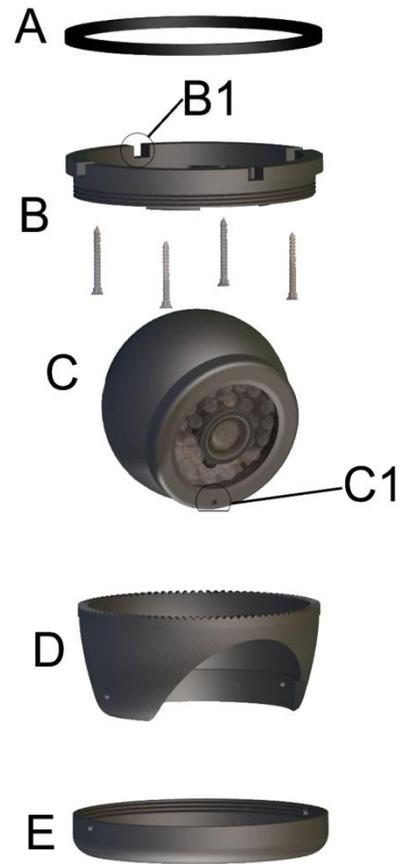
DO NOT disassemble the Camera Ball unless directed to, and under the direction of, a Gatekeeper Systems support technician





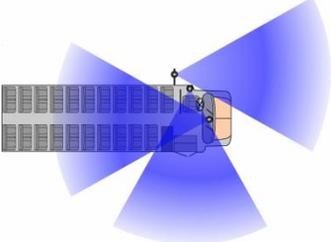
A. Rubber Gasket. B. Base Plate. C. Camera Ball.
D. Camera Collar. E. Retainer Ring

1. Disassemble the camera into its five major parts, A, B, C, D, E and carefully place all parts in a clean work area.
2. Position the Base Plate (B), in the mounting location. Ensure that there are no gaps between the Base Plate (B) and the mounting surface. If there are gaps, relocate the camera to a position where there are no gaps.
3. Note the location where the camera harness will come through the bodywork of the vehicle. Drill a $\frac{3}{4}$ " hole in this location. This $\frac{3}{4}$ " hole MUST be directly in the center of the Base Plate (B) to allow for the terminal end of the camera harness to correctly connect to the Camera Ball (C). When access behind the camera is not possible, the cable can be routed from the side through one of the cut out notches B1 in the camera base. The supplied grommets must be used as part of this procedure.
4. Center the camera over the $\frac{3}{4}$ " hole and mark the location of the 4 screws used to secure the camera base to the vehicle. Ensure that one of the camera cut out notches, B1, is aimed at the viewing target. Use the supplied TEK, self-tapping, screws to fix the camera base to the vehicle.
5. Connect the Camera Ball Molex connector to the connector at the end of the camera harness. Hold the Camera Ball firmly against the Base Plate with the Microphone, C1, pointing downwards. Position Camera Collar (D) over Camera Ball (C) with the lens window centered in the arched cut away in the Camera Collar.
6. Hold Camera Collar (D) securely while threading on the Retainer Ring (E) until finger tight. Be careful not to cross-thread the components.
7. To aim the Camera Ball (C), video from the camera can be viewed by connecting a portable LCD/Monitor with an RCA connection to the front of the 816-HD, or, by use of the ICD accessory available from Gatekeeper Systems.
8. Re-position Camera Collar (D) prior to tightening down the Retainer Ring (E) so that it does not interfere with line of sight of the camera and IR LED's in the Camera Ball (C). Ensure the Camera Ball and Harness pigtail are not pinched or trapped between the Camera Ball (C) or the Base Plate (B), it must be able to move freely.
9. Tighten all accessible set screws on the Retainer Ring (E) and Camera Collar (D). In some installations several of the set screws will not be accessible due to close proximity of the camera to the vehicles bodywork. In this situation tighten down the set screws that are accessible.





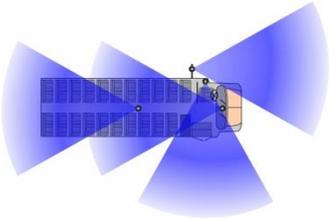
Suggested Camera Locations.



Three Camera Configuration

Check For:

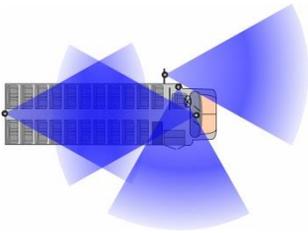
- Ceiling mount recommended.
- Do not obstruct walkways.
- Avoid contact with abrasive metal to prevent short circuits.



Four Camera Configuration

Wire Routing:

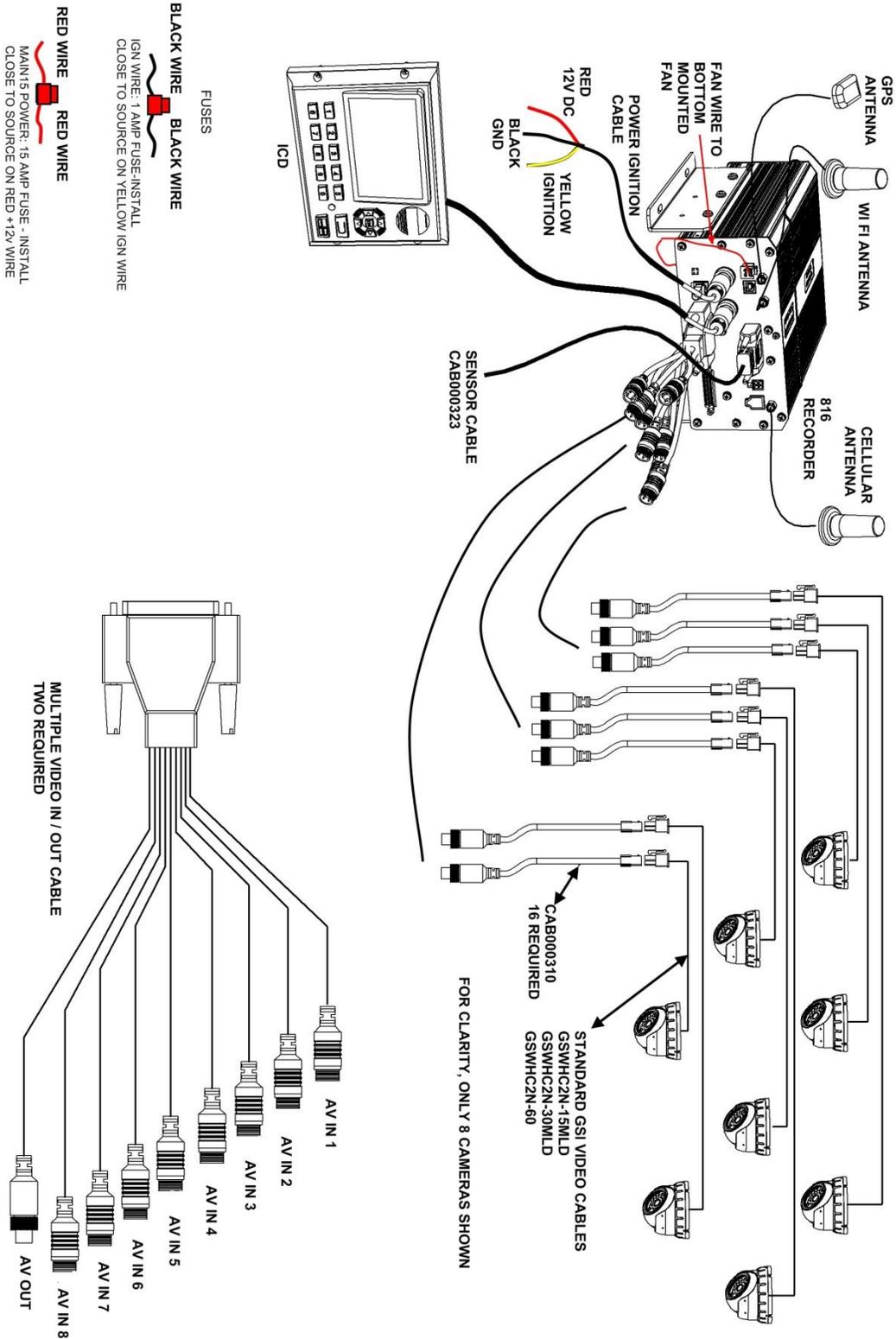
- Camera harness to be connected through opening in base.
- Use existing wire paths wherever possible, radio, speakers, etc.
- Avoid excessively tight bends especially around metal surfaces.
- Always use grommets when routing through sheet metal holes.
- Coil and tie off excess harness or tuck up into ceiling.



Alternate Four Camera Configuration.

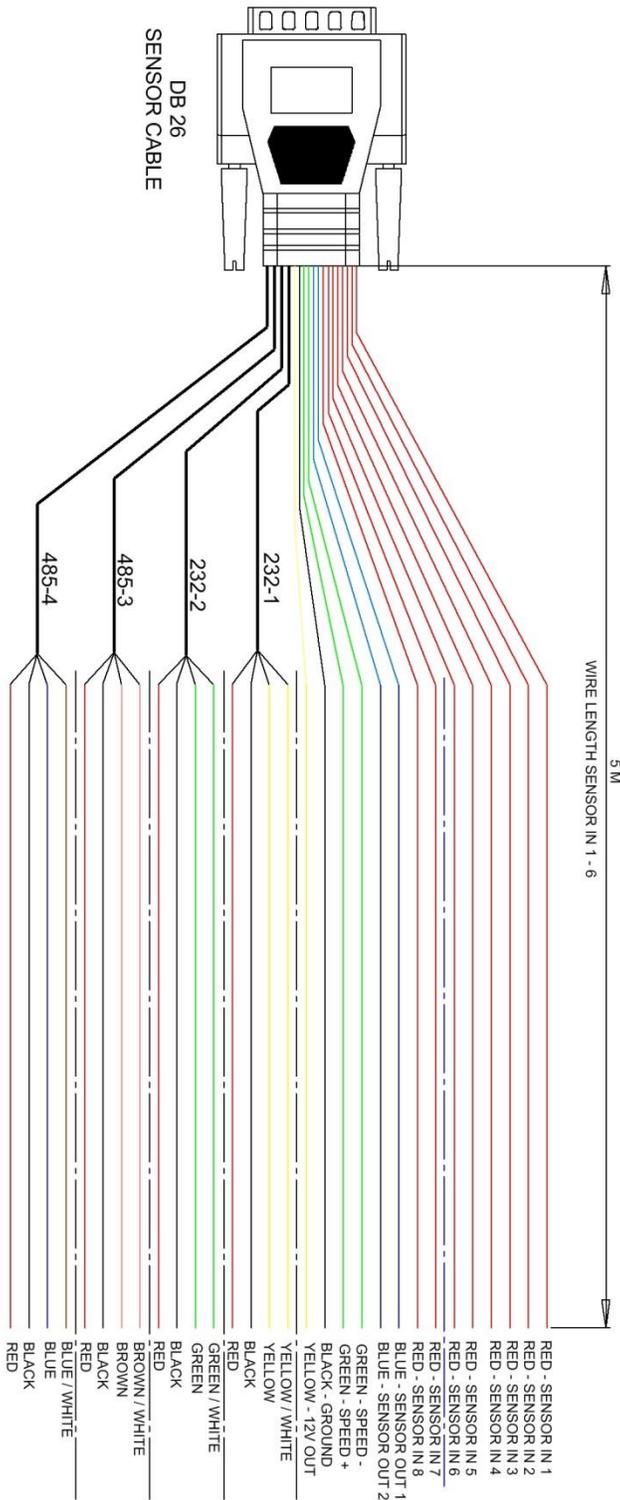


Typical System Wiring Setup.





CAB000323 DB26 Sensor Cable Wiring.





Warranty.



Customer Limited Warranty

GATEKEEPER SYSTEMS INC. (Company) warrants that any product manufactured or supplied by Gatekeeper Systems and found in the reasonable judgment of Gatekeeper Systems to be defective in material or workmanship will be repaired or replaced by Gatekeeper Systems without charge for parts and labor.

This warranty shall cover the following periods and equipment:

Camcorder System

Cameras - 1 year Battery Adapters - 1 year
Plates & Enclosure Boxes - lifetime

Gatekeeper System

Interior Cameras - 5 years
Exterior Cameras - 1 year
VCR - 1 year
GSX-900 / 1000 Digital Recorder - 1 year
NITRO™-900 / 1000 Digital Recorder - 5 years (hard drives limited to 3 years)
NITRO™ 401 and NITRO™ 404 Digital Recorder - 3 years
NITRO-X 401 and NITRO-X 404 Digital Recorder - 3 years
304SD Digital Recorder - 3 years
Kingston SDHC Memory Card - Lifetime
Lexar SDXC Memory Card - 10 Years
Gatekeeper SD Cards - 5 years
All Accessories and Other Products Not Identified above - 1 year

The warranty periods commence on the date of shipment. During the period of the warranty the Company, at its discretion will repair and/or replace all improperly functioning equipment caused by a manufacturer's defect. This warranty does not protect against accidental or intentional damage, vehicle electrical systems generating steady state or transients, voltages or currents exceeding product specification, loss, acts of nature, water damage, or any other event that did not originate during the manufacturer of the product. DVR's must be returned once every twelve months for service otherwise warranty may be void.

The Gatekeeper Systems product including any defective part must be returned to Gatekeeper Systems within the warranty period. The expense of delivering Company product to Gatekeeper Systems for warranty work will be paid by the customer. The expense of delivering Company product back to the customer will be paid by Gatekeeper Systems. Gatekeeper Systems' responsibility in respect to claims is limited to making the required repairs or replacements and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale. Proof of purchase complete with the serial numbers of the products purchased will be required by the customer to substantiate any warranty claim. All warranty work must be performed by an authorized Gatekeeper Systems service representative.

This warranty does not cover any Gatekeeper Systems' product that has been subject to misuse, neglect, negligence, or accident, or that has been operated in any way contrary to the operating instructions as specified by Gatekeeper Systems either verbally, in writing, by instructions written on the product or in the Gatekeeper Systems Installation and Operating Manual. This warranty does not apply to any damage to the Gatekeeper Systems product that is the result of improper maintenance or to any

Gatekeeper Systems' product that has been altered or modified so as to adversely affect the products' operation, performance or durability or that has been altered or modified so as to change its intended use. Gatekeeper Systems' is not responsible for lost or missing video.

The warranty does not extend to repairs made necessary by normal wear or by the use of parts or accessories which are either incompatible with the Company product or adversely affect its operation, performance or durability.

Gatekeeper Systems reserves the right to change or improve the design of any Company product without assuming any obligation to modify any product previously manufactured.

ALL IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE SPECIFIED PERIOD FOR EACH PRODUCT CATEGORY AS LISTED IN THIS DOCUMENT. ACCORDINGLY, ANY SUCH IMPLIED WARRANTIES INCLUDING MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE ARE DISCLAIMED IN THEIR ENTIRETY AFTER THE EXPIRATION OF THE APPROPRIATE WARRANTY PERIOD. GATEKEEPER SYSTEMS' OBLIGATION UNDER THIS WARRANTY IS STRICTLY AND EXCLUSIVELY LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS, AND GATEKEEPER SYSTEMS DOES NOT ASSUME OR AUTHORIZE ANYONE TO ASSUME FOR THEM ANY OTHER OBLIGATION.

GATEKEEPER SYSTEMS ASSUMES NO RESPONSIBILITY FOR INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO THE EXPENSE OF RETURNING THE COMPANY PRODUCT TO GATEKEEPER SYSTEMS CORPORATE HEAD OFFICE, MECHANICS TRAVEL TIME, CUSTOMER LABOR EXPENSES, TELEPHONE OR TELEGRAM CHARGES, RENTAL OF LIKE PRODUCT DURING THE TIME WARRANTY SERVICE IS BEING PERFORMED, TRAVEL, LOSS OF USE OF THE PRODUCT, LOSS OF TIME OR INCONVENIENCE.

Warranty Service

To obtain warranty service, the purchaser must notify the Company during the warranty period. The Purchaser will discuss the defect or problem with a Company technician, and once the problem has been verified the Company will issue a return material authorization number (RMA) authorizing the purchaser to return faulty merchandise to the Company for repair or replacement as determined by the Company. It may be necessary for the customer to assist Gatekeeper Systems in assessing failed product. Gatekeeper Systems may require the customer to remove hardware, manipulate software and/or perform other diagnostic activities. Failure to assist in and allow remote diagnostic activities may result in a service fee being charged.

Advance replacements will be issued for the first 45 days from the date of shipment.

This Warranty applies to all Company products manufactured by Gatekeeper Systems and sold in the United States and Canada.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

USA RECEIVING FACILITY:

Gatekeeper Systems Inc.
446 Harrison Street
Sumas WA 98295
Tel. 1.604.864.6187
Fax 1.604.864.8490
Toll Free [N.A.] 1.888.666.4833

CANADA OPERATIONS:

Gatekeeper Systems Inc.
301-3 1127 Wheel Avenue
Abbotsford BC V2T 6H1
Tel. 1.604.864.6187
Fax. 1.604.864.8490
Toll Free [N.A.] 1.888.666.4833



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Abbotsford, BC V2T 6H1
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Sumas, WA 98295
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Fax: 1.604.864.8472

Toll Free: 1.888.666.4833

E&OE