

# Product Description and Minimum Specifications

**12 Channel Hybrid (8 Analog and 4 IP Channel),  
HDD/SSD Based, Mobile Digital Video Recorder**

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## Introduction

- The below specifications are not intended to limit competitiveness in similar products, rather they are intended to establish a standard of quality and desired features in order to ensure that the needs and requirements of the school district are met.
- The DVR shall support the simultaneous recording of eight (8) analog video/audio channels and four (4) IP video/audio channel.
- The analog cameras shall be dome style flush mount CCD day/night cameras with the capability of mounting to the ceiling or bulkhead.
- The IP camera shall be dome style flush mount CCD day/night cameras with the capability of mounting to the ceiling or bulkhead. The IP camera must be true Wide Dynamic Range. Wide Dynamic Range lenses are insufficient.
- The DVR must operate with 12VDC nominal and include an integrated lockable enclosure and rear cable cover. All wiring harnesses and mounting hardware required for installation must be included. GPS antenna receiver and/or required components to enable GPS mapping and data collection are to be included.
- The product offered must meet/exceed the specifications for Gatekeeper Systems 508HD4 in order to ensure uniformity within the bus fleet.
- Digital Video System; the DVR must support both spinning HDD's up to 2 TB or SSD's up to 480 GB capacity; the DVR must also support both SDXC (Secure Digital Extended Capacity) and SDHC (Secure Digital High Capacity) memory cards. SDHC cards and SDXC cards shall be available from the vendor. The SDXC shall be available up to 128 GB in size. The DVR shall be capable of recording to the SD card as well for mirror recording.
- Any equivalent product that is proposed must be pin for pin electronically compatible with the Gatekeeper Systems 508HD4 Mobile Digital Video Recorder in order to ensure uniformity within the bus fleet.
- Vendors must submit two, 2-minute clips of video, with the proposal. The clips of video must be recorded with the proposed DVR and cameras. One clip must be taken with the proposed analog camera (D1, 15 FPS, and Best Quality) and the second clip must be taken with the proposed IP camera (720p, 15 FPS, Best Quality). The clips must be playable using the standard Windows Media Player included in Windows 7, Windows 8 or Windows 10.

## Mobile Digital Video Recorder Specifications

- The digital video recorder must be equivalent to the Gatekeeper Systems 508HD4.
- The digital video recorder must record a minimum of eight (8) analog video/audio channels and four (4) IP video/audio channel.
- The digital video recorder must have GPS recording capability in addition to the twelve (12) separate video/audio channels. The recorder must not cannibalize one of the video channels to record the GPS data.
- The digital video recorder must record a minimum of twelve audio channels (one associated with each video channel).
- The digital video recorder IP channel must be compliant with ONVIF Profile S, V2.4.
- The digital video recorder must support quick connection of IP cameras (with auto-configuration of IP addresses, subnets and default gateways).
- The digital video recorder must support the Sony 960H wide video standard.
- The digital video recorder must use H.264 video compression technology on the analog channels.
- Besides 960H, the digital video recorder must also be able to support the following standard analog video resolutions D1 (704 x 480), HD1 (704 x 240) and CIF (352 x 240), along with the associated widescreen version of these 3 resolutions (i.e. WD1, WHD1 and WCIF).
- The digital video recorder shall be capable of supporting either a spinning hard disk drive (up to 2 TB), or a solid state drive (up to 480 GB).
- The digital video recorder must support allowing users to download video and/or video of marked events to a USB memory stick that can be inserted in the front of the DVR.
- The digital video recorder shall accommodate 1 SD card (up to 128 GB).
- The digital video recorder must allow for recording of up to 8 analog cameras simultaneously at 240 frames per second at D1 resolution, best quality.
- The digital video recorder must support the following recording frame rates for analog cameras, from 1 to 30 frames per second in 1 frame per second increments. It shall be possible to independently set the frame rate on each video channel independently.
- The digital video recorder must provide adjustable frame rate, resolution and video quality setting for each analog camera independently.
- The digital video recorder must support at least 9 video quality settings for each analog camera.
- The digital video recorder must support daylight savings time and automatically change its time on the appropriate day.
- The digital video recorder must have a thermal management system to maintain the appropriate HDD operating temperature, before writing or reading data in cold weather.
- The digital video recorder must be capable of powering up at -40°C (-40°F).
- The digital video recorder must be capable of operating across an ambient temperature range of -40°C (-40°F) to +70°C (+158°F).
- The digital video recorder must support solid state Secure Digital High Capacity (SDXC) card capacities up to 128 GB.
- The digital video recorder must support solid state Secure Digital High Capacity (SDHC) card capacities up to 32 GB.
- The SD cards provided must be industrial rated with an operating temperature range of -40°C (-40°F) to +85°C (+185°F) and not consumer grade SD cards.
- The digital video recorder must NOT incorporate a fan in the product.
- The digital video recorder must come with an integrated lock box.

- The removable HDD / SSD / SD cards must be swappable between Gatekeeper Systems digital hybrid video recorders without the digital video recorder losing its configuration.
- The digital video recorder must allow for the HDD or SSD drives to interface with a PC without need for a docking station.
- The SD cards shall connect to a PC directly (when the PC has an integral SD card reader) or via a SD card reader with a USB 2.0 interface to a PC.
- The digital video recorder must provide dual streaming. This means a high quality full resolution image can be stored on the HDD or SSD while a lower resolution image can be streamed over the optional cellular connection.
- The digital video recorder must allow for adjustments of the secondary data stream to allow for the different bandwidth available with 3G and 4G cellular.
- The digital video recorder must be field upgradable to support cellular and/or in yard WiFi. Shipping DVR's back to a vendor for upgrade is unacceptable.
- The recorder shall have a keyed electrical interlock that prevents users from inadvertently removing the HDD or SSD before powering down the DVR.
- The recorder shall be small and light for easy mounting in various locations in a bus and shall not exceed the following dimensions: 9" x 7" x 3.25" (230 mm x 180 mm x 80 mm) without cable cover and 11.5" x 7" x 3.25" (290 mm x 180 mm x 80 mm) with optional cable cover.
- The digital video recorder must operate on standard 12 Volts and shall be able to accept an operating range of 8 to 36 Volts.
- The digital video recorder should not draw more than 1 mA when in standby mode.
- The digital video recorder must be equipped with advanced power conditioning circuitry and a high capacity power supply. This means the digital video recorder must be immune to the random power state fluctuations found in vehicle electrical supply, and in cases of power lost, shall be able to close all video files correctly and shut down gracefully to a low power state.
- The digital video recorder must be a maximum weight of 5.6 lbs. (2.5 kg) and be capable of horizontal or vertical installation.
- The digital video recorder must begin recording upon activation of 12V trigger (i.e. ignition activation).
- The digital video recorder must have the option to include a G Sensor.
- The digital video recorder must be designed for a rugged mobile environment and shock and vibration tested to a provision of MIL-STD 810F (Trucks on Streets).
- The digital recorder must be configurable to overwrite data or power off when storage is full.
- The digital video recorder must be capable of formatting the HDD, SSD, SDHC or SDXC solid state cards for erasing data if required.
- The digital video recorder must be capable of playing back video when connected to an NTSC monitor, which recording at the same time (i.e. separate output channel).
- The digital video recorder shall have a minimum of 2 output channels.
- The digital video recorder must have Auto-Record Schedule capability and be able to be programmed on/off up to three times over a 24 hour period.
- The digital video recorder must be capable of adjusting the video quality on each camera (analog and IP) independently.
- The digital video recorder must have the capability to record for up to 23 hours, 59 minutes and 59 seconds after the bus has been turned off.
- The digital video recorder must have the capability to do pre-record up to 60 minutes, and post-record up to 30 minutes.
- The digital video recorder must include the capability to record up to eight event triggers that can be analyzed upon playback.
- The digital video recorder must include 2 output triggers.
- The digital video recorder must be able to output up to 1 amps at 5 Volts.

- The digital video recorder must have the capability to connect to a driver alarm push button switch.
- The digital video recorder must have included an internal GPS module. No external cards or boxes will be accepted except for the external GPS antenna.
- The GPS location and speed information must be recorded and synchronized with the video for subsequent analysis and playback using a compatible viewer provided by the successful vendor.
- The digital video recorder must have motion detection capability.
- The digital video recorder must have a boot time of no more than 60 seconds.
- The digital video recorder must have a minimum 3 year warranty.
- The SD card must have a minimum 3 year warranty.
- The HDD must have a minimum 1 year warranty.
- The digital video recorder must be based on an embedded operating system with the ability to upgrade software in the field without return to the manufacturer.
- The digital video recorder must have a built-in real time clock with automatic Daylight Savings time adjustment.
- The video on the HDD or SSD must be viewable/playable using a, Windows 7, Windows 8 or Windows 10 equipped computer.
- The digital video recorder when equipped with GPS shall automatically update the digital video recorder's real time clock automatically.
- The digital video recorder must have passed ISO 7637-2, Road vehicles — Electrical disturbances from conduction and coupling — Part 2: Electrical transient conduction along supply lines only.
- The digital video recorder must include options for cellular (3G and 4G) and WiFi (802.11N 5GHz) data transmission.
- A driver alert button with, at minimum, a power LED and record LED must be available for use with the recorder.
- The design of the digital video recorder must be such so that it is secured from HDD or SSD removal and changing of configuration without the use of a lock box.
- The digital video recorder must include a key lock mechanism that will allow access to the HDD or SSD when unlocked and simultaneously stops recording to the storage medium so that it is safe to remove the HDD or SSD. When the key lock mechanism is locked it shall be possible to continue recording to the storage medium.
- The digital video recorder's analog channels must come with 4 pin Molex connectors that is consistent with Gatekeeper Systems camera wiring cables.
- The digital video recorder shall include, at no additional cost, 15' power cable and multi conductor sensor cable.

## Mobile Digital Video Recorder Accessories Specifications

### **Touch Panel for In-Vehicle Video Display/Configuration**

- Equivalent to Gatekeeper Systems ICD2 accessory designed to provide an in-vehicle touch-screen interface for accessing all features and functions of the mobile digital video recorder.
- The digital video recorder shall have a touch panel accessory which is industrial rated for vehicle installation.
- The touch panel shall have at minimum a 7 inch LCD color display screen (touch screen) supporting a resolution of 800 x 480.
- The touch panel shall have integrated speakers.
- The touch screen shall have integrated buttons for quick access to video channel selection for display.
- The touch screen must be at minimum IP 53 compliant.
- The touch panel dimensions shall be no more than 7.2" (185 mm) length x 5" (128 mm) width x 1.4" (34.9 mm) height.
- The touch panel shall have a 12 Volts operating voltage and no more than a 200 mA operating current draw.
- The touch panel shall operate over the following temperature range: -4°F to +158°F (-20°C to +70°C).
- The touch panel shall come with at least 3 mounting options.

### **Management Tool**

- Equivalent to Gatekeeper Systems G4 Connect Application for Android and IOS and USB WiFi dongle designed to provide connectivity between the application and the mobile digital video recorder.
- The digital video recorder shall have a quick management tool which supports connection to and configuration of the digital video recorder through an Android or IOS tablet over WiFi.
- The management tool must operate in true plug and play fashion with auto-connect over an ad-hoc WiFi network using a WiFi dongle.
- The WiFi dongle used by the management tool must be capable of being plugged into the USB port at the front of the digital video recorder.
- The WiFi dongle shall operate over the following temperature range: 14°F to +122°F (-10°C to +50°C).
- The management tool shall require username/password for login security.
- The management tool shall provide complete access to all digital video recorder configuration settings.
- The management tool shall be able to perform a firmware update on the digital video recorder.
- The management tool shall be able to stream real-time video from the cameras on the connected digital video recorder.
- The management tool shall be able to search and playback recorded video from the connected digital video recorder.
- The management tool shall be able to export log file data from the digital video recorder remotely.
- The management tool shall be able to import and export the full configuration data file to and from the digital video recorder – allowing for quick replication of configuration settings amongst digital video recorders.

## Interior Analog Cameras Specifications

- The camera must be equivalent to the Gatekeeper Systems S370 Camera.
- The camera must have the capability of mounting flush to header, front bulkhead or ceiling of the bus.
- When mounted to the front bulkhead it must be possible to correctly aim the camera so as to capture the rear seat of a 78 passenger bus.
- Each camera must support the Sony 960H wide video standard.
- Each camera must have a lens windshield that is manufactured from optically clear material.
- Each camera must be housed in an enclosure that is fabricated of metal.
- Each camera must have the capability to allow lenses to be interchanged in the field.
- Each camera must have at least 24 IR LED's that turn on/off automatically with varying light conditions.
- Each camera sensitivity shall be 0.1 LUX/F1.2 (no IR), 0.0 LUX (IR On).
- Each camera shall have a minimum resolution of 700 TV lines.
- Each dimensions of the camera shall be no larger than 2.8" (7cm) high x 3.6" (8.5 cm) base diameter.
- The camera must be a maximum weight of 0.5 lbs. (215 g) and provide flexible cable routing and mounting options.
- Each camera shall include an integrated microphone to capture audio.
- Each camera shall support 3D gimbal functionality to be able to square up an image.
- Each camera shall have the option to be ordered with one of the following lens sizes 2.9 mm, 3.6 mm, 4.3 mm, 6.0 mm, 8.0 mm, and 12.0 mm.
- Each camera shall use a Sony Effio Super HAD II 1/3" CCD (Charge Coupled Device) imaging sensor and Sony DSP (digital signal processor).
- Each camera must be IP 65 compliant.
- The camera housing shall have no vents thus making the camera resistant to water spray.
- Each camera shall operate over the following temperature range: -22°F to +131°F (-30°C to +55°C).
- Once the camera is installed the camera shall be tamper proof to reduce the probability of the aiming of the camera to be changed by a passenger.
- Camera cables must be available in the following lengths: 15', 30', and 60'.
- Each camera shall have a 5 year warranty.

## Interior IP Cameras Specifications

- The camera must be equivalent to the Gatekeeper Systems S31 IP Camera.
- The camera must have the capability of mounting flush to header, front bulkhead or ceiling of the bus.
- When mounted to the front bulkhead it must be possible to correctly aim the camera so as to capture the rear seat of a 78 passenger bus.
- The camera must be true Wide Dynamic Range – wide dynamic range lenses are insufficient.
- Each camera must have a lens windshield that is manufactured from optically clear material.
- Each camera must be housed in an enclosure that is fabricated of metal.
- Each camera must have the capability to allow lenses to be interchanged in the field.
- Each camera must provide 720p (1280 x 720) resolution up to 30 frames per second.
- Each camera must compress the video using H.264 compression.
- Each camera must have at minimum 12 IR LED's that turn on/off automatically with varying light conditions.
- Each camera shall be compliant with ONVIF Profile S, V2.4.
- Each camera sensitivity shall be 0.05LUX/F1.8 (no IR), 0.0 LUX (IR On).
- Each dimensions of the camera shall be no larger than 3" (8 cm) high x 4.3" (11 cm) base diameter.
- The camera must be a maximum weight of 0.5 lbs. (215 g) and provide flexible cable routing and mounting options.
- The camera must support quick setup (with auto-configuration of IP addresses, subnets and default gateways).
- The camera must also have an internal web server for manual configuration.
- Each camera shall include an integrated microphone to capture audio – the microphone shall incorporate audio processing circuitry to filter out noisy environments.
- Each camera shall support 3D gimbal functionality to be able to square up an image.
- Each camera shall have shall have the option to be ordered with one of the following lens sizes 2.8 mm, 4.0 mm, 6.0 mm, and 8.0 mm.
- Each camera shall use a Sony IMX238 1/3" CMOS sensor.
- Each camera must support 12V Power over Ethernet.
- Each camera must have an RJ45 connector so that they can be wired with industry standard CAT 5e cable – proprietary connectors are not acceptable.
- Each camera must be at minimum IP 54 compliant (dust resistant and water spray resistant).
- Each camera shall operate over the following temperature range: -40°F to +158°F (-40°C to +70°C).
- The camera housing shall have no vents thus making the camera resistant to water spray.
- Once the camera is installed the camera shall be tamper proof to reduce the probability of the aiming of the camera to be changed by a passenger.
- CAT 5 cables with industry standard RJ45 jacks must be available in the following lengths: 15', 30' 45' and 60' with strain resistant over molded connectors.
- Each camera shall have a 5 year warranty.



## Exterior Analog Cameras Specifications

- The camera must be equivalent to the Gatekeeper Systems SD-700 Camera.
- The camera must have the capability of mounting flush to surface of the bus.
- The camera must come with flexible mounting arm, and auxiliary bases that shall allow for at minimum the following mounting angles: 0°, 5°, 10°, and 15°.
- Each camera must support the Sony 960H wide video standard.
- Each camera must have a lens windshield that is manufactured from optically clear Polycarbonate material.
- Each camera must be housed in an enclosure that is fabricated of metal.
- Each camera must have the capability to allow lenses to be interchanged in the field.
- Each camera must have at least 12 IR LED's that turn on/off automatically with varying light conditions.
- The camera IR LED's must have a usable operating range of up to 26 feet (8 m).
- Each camera sensitivity shall be 0.1 LUX/F1.2 (no IR), 0.0 LUX (IR On).
- Each camera shall have a minimum resolution of 700 TV lines.
- Each dimensions of the camera shall be no more than 3" (76.4 mm) length x 2.4" (60.5 mm) width x 2.6" (65 mm) height.
- The camera must be a maximum weight of 0.5 lbs. (215 g) and provide flexible cable routing and mounting options.
- Each camera shall have the option to be ordered with one of the following lens sizes 2.9 mm, 3.6 mm, 4.3 mm, 6.0 mm, 8.0 mm, 12.0mm, and 16.0 mm.
- Each camera shall use a Sony Effio Super HAD II 1/3" CCD (Charge Coupled Device) imaging sensor and Sony DSP (digital signal processor).
- Each camera must be IP 67 compliant – dust proof and capable of water immersion up to 3 feet (1 m).
- The camera housing shall have no vents thus making the camera resistant to water spray.
- Each camera shall operate over the following temperature range: -22°F to +131°F (-30°C to +55°C).
- Once the camera is installed the camera shall be tamper proof to reduce the probability of the aiming of the camera to be changed either accidentally or maliciously.
- Camera cables must be available in the following lengths: 15', 30', and 60'.
- Each camera shall have a 5 year warranty.

## Exterior IP Cameras Specifications

- The camera must be equivalent to the Gatekeeper Systems W21-IP Camera.
- The camera must have the capability of mounting flush to surface of the bus.
- The camera must come with flexible mounting arm, and auxiliary bases that shall allow for at minimum the following mounting angles: 0°, 5°, 10°, and 15°.
- The camera must be true Wide Dynamic Range – wide dynamic range lenses are insufficient.
- Each camera must have a lens windshield that is manufactured from optically clear material.
- Each camera must be housed in an enclosure that is fabricated of metal.
- Each camera must have the capability to allow lenses to be interchanged in the field.
- Each camera must provide 720p (1280 x 720) resolution up to 30 frames per second.
- Each camera must compress the video using H.264 compression.
- Each camera must have at minimum 12 IR LED's that turn on/off automatically with varying light conditions.
- Each camera shall be compliant with ONVIF Profile S, V2.4.
- Each camera sensitivity shall be 0.05LUX/F1.2 (no IR), 0.0 LUX (IR On).
- Each dimensions of the camera shall be no larger than 2.3" (6 cm) high x 4.3" (11 cm) base diameter.
- The camera must be a maximum weight of 0.5 lbs. (215 g) and provide flexible cable routing and mounting options.
- The camera must support quick setup (with auto-configuration of IP addresses, subnets and default gateways).
- The camera must also have an internal web server for manual configuration.
- Each camera shall have shall have the option to be ordered with one of the following lens sizes 2.8 mm, 4.0 mm, 6.0 mm, and 8.0 mm.
- Each camera shall use a Sony IMX238 1/3" CMOS sensor.
- Each camera must support 12V Power over Ethernet.
- Each camera must have an RJ45 connector so that they can be wired with industry standard CAT 5e cable – proprietary connectors are not acceptable.
- Each camera must be IP 67 compliant – dust proof and capable of water immersion up to 3 feet (1 m).
- Each camera shall operate over the following temperature range: -40°F to +158°F (-40°C to +70°C).
- The camera housing shall have no vents thus making the camera resistant to water spray.
- Once the camera is installed the camera shall be tamper proof to reduce the probability of the aiming of the camera to be changed either accidentally or maliciously.
- CAT 5 cables with industry standard RJ45 jacks must be available in the following lengths: 15', 30' 45' and 60' with strain resistant over molded connectors.
- Each camera shall have a 5 year warranty.

## Viewing Software Specifications

- The viewing software must be equivalent to the Gatekeeper Systems G4 Viewer Plus software application.
- The viewing software shall be included in the system price at no extra charge.
- The viewing software must be able to display up to thirty six (36) channels of both live streaming video (both analog and IP video) simultaneously on a video wall.
- The viewing software must be able to playback up to nine (9) channels of recorded video (both analog and IP video) simultaneously.
- The viewing software must display bus ID, time, date, event triggers, GPS information and speed.
- The viewing software must display the video file time, date, bus ID, and number of alarms.
- The viewing software must display a graphic view of vehicle telemetry data (speed, ACC, sensors).
- The viewing software must provide multiple search filters for video – including by date, speed, geofence, and event.
- The viewing software must have the capability to save portions of a video file into a clip to be specified by the user.
- The viewing software must provide the ability to tag, categorize and manage video clip files.
- The viewing software must provide the user with a means to fast forward and rewind, pause and play all video files.
- The viewing software must be able to provide multiple playback speed options – from 1/4x to 4x.
- The viewing software must have the ability to capture still images at any point in the video as specified by user and saved as an industry standard image file (JPEG or BMP).
- The viewing software must display the date, time, bus ID of each event trigger.
- The viewing software must operate on the following operating systems: Microsoft Windows 7, Microsoft Windows 8, and Microsoft Windows 10.
- The viewing software must provide a map view that displays the location of the vehicle using Google Maps when video (with GPS information) is being played.
- The viewing software must support blurring of selective areas of the image (video redaction prior to export).
- There shall be an option in the viewing software that a password must be entered before the viewing software will launch.
- The viewing software must be able to produce video clips as follows:
  - AVI – compatible with the standard Windows Media Player found in Microsoft Vista, Windows 7, Windows 8, and Windows 10 without the addition of any codecs.
  - Mini Player – a self-contained executable that contains a lite version of the viewer and the clipped video. It shall be possible to password protect the file from opening. The mini player must also have mapping, sensor data, and GPS data.
  - Native – these clips shall be subsets of the raw video produced by the digital video recorder. There shall be no alteration to the original video data.