

The systems required must meet the following minimum requirements: [HC460 with Internal VSM Included](#)

## CAMERA

- Cameras shall include the following:
  - Shatterproof lenses
  - Omni Position
  - Anti-Glare Glass
  - Scratch resistant
  - High Impact
  - Microphones with built-in Noise Gate Omni Direction
  - Moisture Proof
  - Temperature resistant
- 520 TV Line Resolution
- Cameras must be fixed in cast metal vandal proof housing
- PeriOptic Wide Dynamic Lens
- CX3 Sony Chip Set Only
- Identify appropriate camera and lenses to have full view of bus areas (front, back, driver, stairwell section, and stop arm)
- Day/Night camera shall have built-in Infrared LEDs.
- Input image to DVR shall be Clear, Stable and Free of Vibration.
- Shall be mounted without brackets to Ceiling, Surface, Wall, or Side.
- Shall be available in various lens sizes range of 2.1mm to 25mm
- Must have 6PIN DIN waterproof connection
- **MOBILE DVR (With Hybrid Component Technology)**
  - DVR must be completely serviceable without removing the DVR from the bus.
  - DVR shall have removable front door for access to Motherboard, Power Control Board, hard drive and Internal VSM Module.
  - DVR must have “**Linear Motion Slide Rail**” Component Removable Motherboard inside front door for easy service and technology upgrade. Removing the Motherboard does not require removing the DVR. Removing the motherboard requires the removable of two external screws only. A new Motherboard can be inserted and installed in under 1 minute.
  - DVR must have “**Linear Motion Slide Rail**” Component Removable Power Control Board inside front door for easy service and technology upgrade. Removing the Power Control Board does not require removing the DVR. Removing the Power Control Board requires the removable of two external screws only. A new Power Control Board can be inserted and installed in under 1 minute.
  - DVR must have “**Linear Motion Slide Rail**” Component Removable VSM GPS Module inside front door for easy add, service and technology upgrade. Removing the VSM GPS Module does not require removing the DVR. Removing the VSM GPS Module requires the removable of two external screws only. A new VSM Module can be inserted and installed in under 1 minute.
  - DVR must be able to accept 8ch Motherboard by swapping the 4ch motherboard with the 8ch motherboard. The DVR is now capable of 8 channels of audio and video with this quick change.
  - DVR must have connection for Optional Live TFT Monitor.
  - Footprint not to exceed (Width x Height x Depth) 4” x 3.5” x 8.75” and Weight not to exceed 3.45 lbs.
  - The DVR shall have the capability to be installed at any angle, in an easily accessible location.
  - The system supplied must offer 1 to 4 Channel Video and a minimum of 4 Channel Audio with simultaneous recording.
  - System is to include up to 4 camera inputs, with simultaneous recording on individual channels, with independent audio.
  - The system must have easy marking capabilities with a Push Button Event button.

- System should have protection from access of unauthorized personnel by not having any accessible controls/buttons on the DVR face and should offer a wireless remote control for easy set up and programming by any authorized personnel.
- Hard Drive shall have storage capacity of minimum 160GB Hard High Speed SATA drive, must be “hot swappable”, Removable, Expandable capabilities to 1TB. Must be Tamper proof & lockable 2.5” in a shock resistant housing.
- Operate from direct 10-36 VDC power source connected with 18 gauge wire or larger, with inline fuse and be internally and continually protected from power surges, spikes and reverse polarity.
- Must offer back-up battery that will save settings for up to 10 years.
- Must be equipped with an RS-232 Serial Port for future expansions. This port must be able to interface with any device that accepts serial communications. Must also include LAN connection for wireless capability.
- Camera Connectors must be 6 pin DIN; with screw on connectors that include Audio, Video, Power and Ground with Water Resistant connectors.
- Unit must offer High and Low Temperature Protection
- Must offer crisp Video at 720 x 584 resolutions for DVD quality playback.
- Recording modes must be user selectable for Continuous, Motion or Alarm. In continuous mode, Storage capacity must not be impacted by motion.
- Can automatically record over data files once the hours of audio/video capacity has been reached, beginning with the oldest data first. Must not erase Hard Drive Data when over-write begins.
- On-board real time clock that operates independently of main power supply. Must adjust automatically for daylight savings time.
- Must have 8 sensor inputs for marking events, to include left turn, right turn, brake, Door 1, Door 2, reverse, stop arm and amber lights. Must have a Driver event marker button.
- Display resolution must have full support for NTSC and PAL and be user selectable.
- DVR must have delay start, of not more than 10 seconds, for the system to boot up and begin recording upon activation of bus engine run switch to allow for voltage stabilization.
- DVR must have delay stop to allow continued recording after the bus is turned off; user selectable 0, 5, 10, 20, 40 or 60 minutes.
- Must be capable of accepting a minimum of four independent channels of audio as well as record and playback all channels of user defined mixed audio.
- Must be capable of setting and recording real time images and sound from 1 to 30 frames per second (fps) per channel.
- User Password protected; defined security levels.
- Must provide on-screen data of left turn, right turn, front door, rear door, amber lights, reverse, brake lights, stop arm, (from signal inputs) Vehicle identifier, date, time.
- System must have integrated OPTIONAL Passive GPS DATA LOGGER Module, with no outside subscription service requirement. OPTIONAL LOGGER must store up to 6 months of data. Must display heading and speed on screen during playback.
- OPTIONAL GPS must be compatible with software that can extract .gpx, .kml and .gps data for TeleAtlas/Google Map Overlay.
- On Screen data of OPTIONAL GPS coordinates, Direction, and Speed must be imprinted on recorded video, synchronized with the camera(s).
- Must include HOST and SLAVE USB connection for easy firmware upgrade and Laptop connection.
- DVR must include built-in lock box for securing connections and hard drive
- DVR must have SLAVE USB input for direct laptop connection to operate and retrieve video files.
- DVR must have HOST USB connection for firmware upgrade capabilities
- DVR must have composite Audio/Video connection on the front door accessible without door removable.

## **Virtual Synchronized Mapping - VSM**

System must include Built-In VSM GPS – Virtual Synchronized Mapping, providing on-screen route tracking to identify movements of the vehicle on a digital street map, synchronized with the cameras views and recorded to the DVR. Please note that providing and/or recording only the GPS coordinates does not meet this specification. The street map must be recorded onto a camera channel of the DVR to ensure synchronization with the cameras. When viewing the video, the map view must not require an internet connection. Must include Licensed TeleAtlas embedded maps on the hardware to ensure accuracy.

## **Video Retrieval PC Playback Software and Archiving**

- Video review shall be accomplished with a PC and supplied software
- Must have non-proprietary SATA Hard Drive with built-in USB reader.
- No other office hardware shall be required.
- Transfer rates must be less than 1:1; Rate shall be provided.
- Must be Wireless capable.
- The system must be equipped with a USB memory stick process to quickly review or download events from the on-board system.
- Video must be secured through the use of proprietary software. The software must require user name and password entry.
- Review software must be user-friendly. Must allow for one screen viewing of all cameras, with options to select any single camera view, Must be able to copy video to PC (user selectable by time frame), to create a JPEG, WMV or an AVI file. Must include options to play, stop, forward, reverse, pause, frame by frame forward, frame by frame reverse, beginning of video file, end of video file and volume control for audio, camera selection buttons and time slider.
- Plug N Play read capability for fast file transfer utilizing PC based file formats (with no additional hardware).
- Easily “tag/mark” the hard drive, search, pause/freeze and download captured events to PC, USB flash drive or direct to DVD burner, or print frame by frame.
- Archiving must be able to be saved on the PC or transferred to DVD, VHS, and other forms of archiving. The hard drive must be able to be connected to the computer through a USB reader connection without addition reader.
- Able to retrieve events downloaded directly on USB drive via USB 2.0 connections/port or direct connection to Laptop.
- At a minimum, capability of tracking and playback – inquiry by alarm, date, time and camera.
- Fail safe, “System On” protection that includes a record light that will flash during the recording, a power light and camera light that will flash to indicate the unit functioning properly, and finally an audible alarm that will sound if there is a hard drive failure.
- Easily retrieve and archive data (Provide capacity and time frame for archived data)
- Must have capability to easily forward and view video and audio clips/frames as attachment to email.
- Must offer the latest MPEG4 and MJPEG plus H.264 compression technology (selectable) providing motion picture quality, while offering greater storage capacity.
- Video Quality: 16 Settings: 4 adjustment levels with 4 quality settings for each adjustment level
- Display Speed: Must offer 9 settings at 1, 3, 5, 7, 10, 12, 15, 30, 60 fps
- Display Modes: single camera, QUAD, 4x zoom

## **Maintenance and Software Upgrades**

- Automatic software upgrades at no additional cost for minimum of two (2) Years.
- Provide contact(s) information for technical support. No additional charge
- Must not require any additional Maintenance Support other than periodic testing for proper operation.

### **Installation**

- Provide timeline on installation, testing and start-up.
- Provide the number of dedicated technical support and/or installers for this project.
- Staff employees shall be trained and certified on installs, at no additional cost.
- System must be designed and supported by the manufacturer and the manufacturer must have experience installing and servicing systems on School Mass Transit Buses.

### **Warranty**

- Five (5) year minimum Parts and Labor warranty on DVR unit, cables and hard drive; Three (3) year minimum Parts and Labor warranty on Cameras.
- Extended warranties shall be available to provide more than 3 years coverage.
- All warranty information on hardware, cameras and installation must be supplied in bid response.
- Service: Bidder is factory authorized to repair equipment offered during warranty period. Warranty service will be performed by bidder.
- If systems purchased on a Lease/Purchase program, the warranty, on the complete system, is extended to the length of the lease/purchase term or 3 years, whichever is greater.

### **Training and Technical Support**

- Supply complete user training of equipment and installation
- Online and current manufacturer user manuals
- The system purchase will include a 1-800 engineering support line and offer technical support at no additional cost. System purchase will offer free software upgrades for a period of at least 2 years.