

## ATTACHMENT B TECHNICAL SPECIFICATIONS

The following technical specifications are intended only to describe the minimal capabilities of the video and audio recording equipment that TJPAMC intends to purchase. Vendors are permitted to propose alternatives to these specifications, although any area in which a vendor doesn't meet these minimal specifications may, at the sole discretion of TJPAMC, render the bid non-responsive.

### **Video Recording**

- H.264 Main Profile video compression
- 8 channels of video and audio
- One channel of audio per video channel (8 channels of audio). Each audio channel must be able to be disabled independently.
- Selectable Resolution: CIF (352X240), 2CIF (704X240), or D1 (704X480) (3 settings)
- Selectable Frame Rate: 1, 2, 3.75, 5, 7.5, 10, 15, 20, 25, 30 frames per second per channel
- Selectable Quality: 1-9 (9 settings) - Must have a 5mb bitrates per channel option
- Resolution, frame rate, and quality configurable independently for each channel
- Dual stream encoding – configurable low-bandwidth sub-stream for 3G/4G live viewing
- Predicted record time displayed in UI
- Automatic hard drives overwrite or write-once modes – user selectable
- Alarm event tagging for automatic/manual download and to provide fast access to alarm events during playback
- Alarm triggering based on panic button, input (brakes, stop arm, etc. - up to 8 total), vehicle speed,
- Acceleration (collision, hard braking, etc.), or J1939 data
- Alarm videos protected from overwrite - protect for 0, 3, 7, 10, 15, 20, 30, 45, or 60 days, or continuously protected
- Increased frame rate on alarm occurrence: up to 30 frames per second
- Vehicle data, including inputs, speed, acceleration, and GPS coordinates stored continuously with video at all times – “black box” data recording functionality
- Time stamp, vehicle ID, camera names, and vehicle data permanently embedded in video data as metadata – no video permanently obscured by text, etc.
- Audio, video, and vehicle data stored fully synchronized in a proprietary tamper-resistant file format with no known editing method - assures integrity of video evidence and associated data
  - \* Record mode: ignition, schedule, ignition or schedule, and ignition and schedule.
  - \* Must be able to adjust brightness, contrast and coloring of the video prior to recording (independently for each channel)
  - \* Must have grid selectable motion detection for each channel independently

### **USB**

- USB automatic backup function
  - \* Automatic or manual backup of alarm video to USB storage device
  - \* Priority based automatic backup – high priority alarms copied first
  - \* Automatic removal of alarm protection on backup – user configurable
- USB firmware update and configuration

## ATTACHMENT B TECHNICAL SPECIFICATIONS

- \* Automatic or manual firmware update from USB storage device
- \* Configuration saves and loads from USB storage device

### **Hard Drive Module**

- Removable, locking hard disk drive (HDD) housing with 2.5 HDD with 1TB capacity
- Shock and vibration dampening fully integrated into HDD housing
- All metal housing construction
- USB 2.0 ports on HDD housing for direct connection to a host PC – no docking station required
- Key-switch on HDD housing to lock USB port to prevent unauthorized access to the HDD contents and assure integrity of video evidence
  - \* External power connector on back of module
  - \* LED indication for power and HDD activity

### **Power**

- Fully regulated power supply for error free operation with varying input voltage – 8-30 volt input range
- Fully protected against overvoltage, transients, and reverse-polarity
- Low-voltage cutoff with automatic restart
- Programmable off delay: 199 min
- DVR switched on/off automatically by vehicle ignition, schedule, or logical combination of both (user selectable)
- Seven day schedule with two adjustable ranges per day
- Low power mode for reduced power consumption during video archiving through a network – schedule or timer based
- 12-14 gauge pre-terminated power cable standard

### **Physical/Environmental**

- Small form factor
- Wide operating temperature range design: -40 to +65 C.
- Fan-less cooling design
- Industrial extruded aluminum chassis for cooling and vandal resistance
- All cables attach directly to the DVR via locking connectors - no breakout cables and/or boxes required
- No active controls on the front panel of the DVR to be tampered with or damaged
- Flexible mounting options – DVR may be top (under-seat), bottom (floor), or vertically mounted using the included brackets
- DVR chassis may be hard mounted and requires no additional shock and vibration protection – hard drive module includes all shock and vibration dampening internally
- 16 gauge steel lock box with key-lock and piano hinged door
- Removable rear end panel to protect the DVR cables from damage and/or intentional disconnection
- Removable front end panel to protect DVR face

## ATTACHMENT B TECHNICAL SPECIFICATIONS

### **Inputs and Outputs**

- Analog audio/video outputs on front panel for optional local configuration and video review
- 8 sensor inputs for connection to vehicle signals for data recording and alarm/event detection
  - \* Individually configurable sensor input names as well as common presets
  - \* Individually configurable as active high (switch positive) or active low (switched ground) in firmware
  - \* Individually configurable as marked events or protected alarms
- J1939 interface for connection to in-vehicle network
  - \* Record vehicle speed, brakes, etc. direct from vehicle network
  - \* Event detection and diagnostics from J1939 data – alarm/event detection of excessive vehicle idling, low tire pressure, etc. (custom function – dependent on make/model/options of vehicle)
- Analog speedometer input with user selectable sensitivity and calibration
  - \* Displays available in MPH or KM/H
  - \* Manual or automatic calibration
  - \* Configurable high and low speeds as marked events or protected alarms
- 8 camera inputs with coaxial video, coaxial audio, power and isolated ground on a single locking connector
- 2 Ethernet ports (2X RJ45 – 10/100 Base-T) on the front and back of the unit for expansion (Wi-Fi, 3G, etc.) and local configuration, video review, and archiving
- Panic button to allow driver/user to easily tag events in the recorded video which includes an external record indicator to display system (recording) status to the driver/user
- GPS module for continuous recording of vehicle location, heading, and speed, as well as configurable and automatic time and date synchronization
- Optional 3-axis 10G accelerometer/inertia sensor for data recording and detection of hard braking, accident detection, etc.
  - \* Each axis individually configurable for G force threshold
  - \* Each axis individually configurable as marked events or protected alarms
  - \* Calibration (zeroing) of unit after installation in vehicle
- Optional Drivers Display module for diagnostics display, data entry, and messaging
- Optional Output Module for connection to third party systems (AVL, etc.) for status and fault reporting, etc.

### **Diagnostics**

- Selectable audible or visual fault alerts
- Video loss detection for each camera
- Blind camera detection for each camera - minimum 5 levels of sensitivity
- Detection of system and hard drive faults
- System fault indicator on front panel
- Video present indicators for each camera on the front panel
- Remote record status and fault indicator (with optional panic button/record indicator)
- Status and fault reporting to third party systems (AVL, etc., with optional output module)

## ATTACHMENT B TECHNICAL SPECIFICATIONS

- Recorded highest and lowest system temperature and voltages along with date and time of occurrence
- Display of current firmware versions and available hard disk drive space
- DVR must maintain a log of all vehicle events time and date stamped
  - \* IGN on/off
  - \* System on/off
  - \* Over Correct
  - \* Over/Under temp
  - \* Over/under voltage
  - \* FW update
  - \* Configuration Change
  - \* Local login
  - \* WEB login
  - \* Net link up/down
  - \* Record Start/stop
  - \* HDD removal
  - \* HDD format

### **Other Features**

- Built in clock-calendar accurate to within +/- 4 minutes per year across the entire operating temperature range (-40 to +60 C)
  - \* Internal 10 year clock battery for accurate time in or out of the bus
  - \* Embedded time stamp recorded with video (as metadata – does not obscure video)
  - \* Selectable NTP or GPS time synchronization including time synchronization options and GMT offset
  - \* Customizable and automatic Daylight Saving Time adjustment
- Local playback and configuration with included remote control (requires monitor)
- Optional password for DVR configuration and access through local UI, Web UI, or vendor-supplied application
- DVR configuration import & export functionality
- DVR firmware must be field upgradable through USB flash drive and through Ethernet connection

### **Cameras**

- Box, Dome, and Interior/Exterior wedge designs available
- Integrated IR illuminators with automatic on/off
- Vandal resistant die-cast metal housings and polycarbonate domes/windows on all models
- IP68 rating on Exterior wedge designs
- Built in high quality microphone with level adjustment on all cameras (excluding exterior wedge)
- Single cable connection to DVR – video, audio, and power on a single cable with locking connectors

ATTACHMENT B  
TECHNICAL SPECIFICATIONS

**Manufacturer/Company Standards and Certifications**

- The entire business shall be governed by International ISO 9001:2000 Quality Standards, ensuring only the highest quality products.
- Manufacturer must provide free live technical support 12 hours a day, 7 days a week
- Technical support must NOT be 3<sup>rd</sup> Party
- Technical support must be United States based
- Supplier's main corporate office and core business entities must be located in the United States