

# Overview of BUS-Vigil

By Cradle Technologies

[www.cradle.com](http://www.cradle.com)

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## Overview

Cradle Technology's BUS-Vigil is a superior surveillance system specifically designed for rugged school bus and mass transit applications. The system consists of an industrial grade Digital Video Recording system encased in a tamperproof, steel security cabinet and a surveillance camera of sturdy steel housing.

As an option, the BUS-Vigil can monitor and record vehicle functions such as warning lamp operation, brake, vehicle speed, and two user defined points.

## Expanded System Overview

**BUS-Vigil** surveillance systems are highly configurable. User can connect 1, 2, 3 or 4 Cameras.

To be able to switch between different cameras based upon an external trigger (such as a door opening); a Camera Switch Device can be added to this system configuration to allow for more than one camera to be connected to the Digital Video Recorder.

The System can record and view more than one camera simultaneously.

## DVR Features

1. Search Video by Date, Hour, or External Event Triggers.
2. Hand held programming device option.
3. Hard drive heater to warm the hard drive to a safe operating temperature in cold weather.
4. Non-volatile ROM and battery backed-up memory.
5. Ten 24-hr. programmable timers that are used to start and stop the recording process without user (driver) intervention.
6. Time and date are at the bottom of the picture so detail at the top of the picture is not hidden. Location of display for time and date can be customized to meet individual requirements.
7. Optional - Front panel keypad for easy programming of options and features.
8. Audio and video jacks located on the front of BUS-Vigil for easy access.
9. 250 GB Hard Drive provides more than 90 days of recording for 4 Camera's.

## System Components

1. Industrial grade Digital Video Recorder.
2. Camera to BUS-Vigil cable harness (Wide Dynamic Range Camera. – Optionally available)
3. Hard Drive Module.
4. Slide mount bracket
5. BUS-Vigil Cabinet power cable.

## Initial Set Up

The Digital **BUS-Vigil** system will operate without any user setup; it uses its default settings. However, it may not show the correct time and date (Factory Set to Central Standard Time). To set the correct date and time simply connect a Laptop to the unit's Ethernet Port and Set the Date and Time as desired. After this, the clock will continue to run even when powered off and this configuration is required to be done only at the time of installation.

## Video Backup Process and Hard Drive Formatting.

Video Backup of an event can be retrieved extremely easily. Only a Laptop and an Ethernet cable is required. A user friendly Graphical User Interface allows the user retrieve historical data based on a set of parameters specified by him.

The backup tool allows event based backup or time based backup to be taken.

## System Start-Up

To start the recording process, place the *system switch* in the ON position (this will be done automatically if the *system switch* is connected to the ignition switch and the ignition switch is in the ON position). Upon turning the system switch ON, the BUS-Vigil will commence recording.

To stop the recording process, place the *system switch* in the OFF position. If the OFF DELAY option is enabled, the BUS-Vigil will continue to record for the prescribed number of minutes. When the off-delay expires, the camera and BUS-Vigil shut off.

**Note:** The BUS-Vigil will not function if the hard drive key is in the unlocked position. If there is no hard drive present in the bay but the key is in the locked position, the BUS-Vigil will still power up normally, the menus can be accessed, etc.; however, the unit will not be able to record any video and the screen will read "DISK ERROR" also a beeper alerts the user of a hard-disk not present error.



## **Bus-Vigil Security Cabinet**

The BUS-Vigil security cabinet can be mounted in any orthogonal orientation under a seat, in a parcel rack, on the floor, to a wall, etc. It should not present a trip hazard or head impact hazard, nor should it interfere with the seating, safety or comfort of the passengers. Horizontal orientation is suggested when several installation options are available.

## **Long Term Storage**

If the BUS-Vigil system is installed but not used for an extended period of time (longer than 2 weeks) it is recommended that the main power toggle on the front panel be set in the OFF position.

Bus-Vigil can allow storage up to few weeks in default configuration. The more storage options are available in on demand.

## **System Installation**

For the basic system there are two cables, power and camera. For additional vehicle monitoring, the BUS-Vigil Vehicle Sensor Options harness is available. For external record indication, and alarm/event marking, the Record Indicator / Event Mark Button Harness is available.

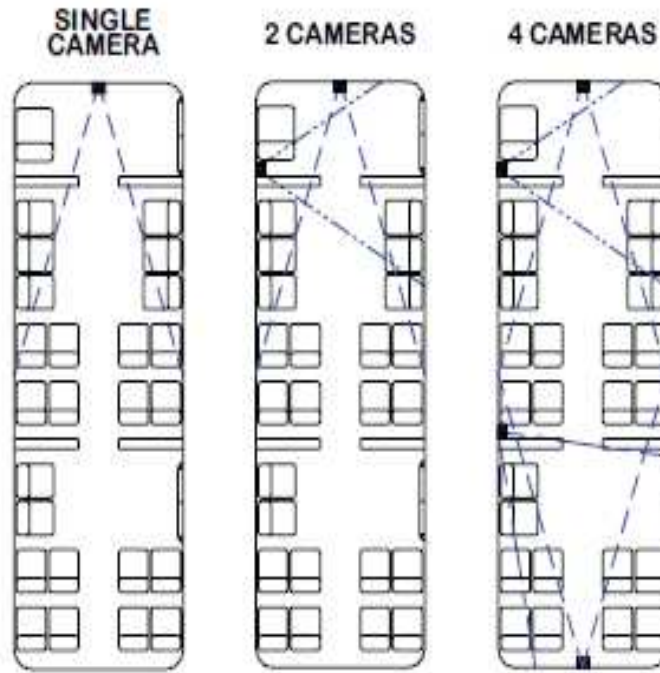
## **System Wiring**

All cables should be hidden from view.

Connect the camera(s) using the specified cable or equivalent. There is no specific orientation for camera cables to be installed. If multiple types of cameras are installed in a single system, be careful to note which cameras are located where. Use lenses with more magnification (8mm) for to bring objects closer that are far away. Use lenses with less magnification (4mm) for wide-angle viewing.

Connect power using the cable provided or it's equivalent. The black wire connects to the negative terminal of the battery. The green wire (labeled 12V MEM) connects directly to the positive terminal of the battery. The green wire should be fused at 4A if using a single camera system.

Potential Multiple Camera Placement



**Vehicle Sensors**

Exposed connectors may be placed inside of connector box on security cabinet. Tampering could be further reduced by using metal conduit to route exposed wires into vehicle body. All wires should be protected from the inside and outside areas of the vehicle. Convoluted split loom should be used in all other areas to further protect the wires. All wire connections should be splice soldered and insulated or lugged.



## **External Record Indicator**

The BUS-Vigil Vehicle Sensor Options Harness connects to various locations in the vehicle to provide on-screen information regarding vehicle performance. Many vehicles have different sets of signals that can be monitored.

The default School Bus monitored points in the vehicle are:

1. Vehicle speed
2. Brake activation
3. Amber warning lamp operation
4. Red warning lamp operation
5. Stop arm lamp operation

Optional points with AUX 1 & AUX 2 (Aux 1 & Aux 2 are user-defined and may be used to monitor points such as turn signals, rear and front doors, etc.)

## **Installation of BUS-Vigil DVR**

Find a suitable location to mount the slide bracket on the floor. The Cradle's Bus-Vigil should not present a trip hazard or head impact hazard and should not interfere with the seating, safety, or comfort of the passengers.

1. An area 15 and 1/2 inches should be unobstructed in front of the slide bracket to allow sliding the Cradle's BUS-Vigil onto the bracket.
2. Position the slide bracket on the floor and drill four 3/16th inch holes into the floor using the mounting holes as a guide.
3. Set aside the slide bracket. Position four-rubber shock mounts over the pilot holes.
4. Place the slide bracket over the rubber shock mounts. Align the mounting holes to the center of the shock mounts.
5. Secure slide bracket to the floor using four lag bolts.
6. Carefully slide the cabinet onto the slide bracket being sure to check alignment of the connector. Lock to secure.

## **Warnings**

1. Disconnect Vehicle Battery voltage before Installation of system wiring
2. Disconnect Power to Bus-Vigil DVR before jump-starting the vehicle.
3. Observe proper DVR Floor Mounting, Slide bracket conditions

## BUS-Vigil Technical Specifications

<b>Detailed Technical Specifications</b>	
<b>Video encoding / Compression</b>	MPEG-4 Encoding supports NTSC/PAL Video Streams. (4 Ch. CIF (1 Channel D1) @ 30 fps (25 fps PAL))
<b>Network Support</b>	Embedded network support. RTP/UDP/IP support. , TCP/IP Control Client, DHCP Client, HTTP Server, Email Client/Sever
<b>Encryption</b>	128 Bit AES encryption support.
<b>Video Alarm Support</b>	Blind Video, Video Loss, Motion Detection
<b>Audio Input / output</b>	4 Channel G.711 audio in and 1 audio outputs.
<b>Remote / Field Upgrade</b>	Supported. Remote configuration and version revision. Upgradeable over TCP/IP as well as locally
<b>Vehicle Sensors and external record indicator</b>	Supported as per the requirement.
<b>Video Camera Control using PTZ Support</b>	Pelco, Vicon, Panasonic.
<b>MPEG-4 Encoding.</b>	Simple Profile, MPEG-4, Part 2 Compliant, Progressive or Interlaced , CBR settable from 64 Kbps to 5 Mbps. , VBR with Max. Limit, I-Frame on Demand.
<b>Audio Encoding / decoding</b>	G.711 ( u-Law or A-Law ) encoder for 4 Channel Audio , input Channels and G.711 Audio Decoder for audio , received from the client and to be output to the speakers
<b>System delay</b>	Video encoder < 200 milliseconds. System Video to network client < 350 milliseconds.
<b>Local Storage</b>	IDE Hard Disk Drive 2.5".
<b>Alarm Inputs / Outputs</b>	"Bit-bang" alarm pins , E-mail / TCP-IP notification , Motion Detection , OSD Provisioning.
<b>Spot Monitor</b>	Composite Video Output
<b>Video Processing</b>	Hue, Saturation, Contrast, Brightness controls for Video Input
<b>Interfaces</b>	2 X Asynchronous Serial Channels for interfacing to GSM / GPRS /CDMA networks for alarm communication, OSD
<b>Client software</b>	For running the recorded video in the lab for forensic purpose.