

Advanced Video and Data Vehicular Recorder

Features and Capabilities

VAADR SFF-CAN

- Record 2 color cameras/ sensors
- Record raw Bayer data
- Record vehicular CAN data, synchronized to the video
- Instant access to video
- Show vehicle GPS track over maps synchronized to video
- Connect to additional VAADR for more channels of synchronized video recording.
- Various drive sizes

Other Features

- Small, lightweight
- Easy to install and operate
- Customizable for various sensors and data
- Expansion capabilities to other cameras/sensors and inetrfaces

Applications

- Vehicular sensor testing
- Data gathering for image processing experimentation
- R/D for surround-view, top-view, analytics, etc.
- Build a library of corner-case automotive video anomalies
- Road-test documentation

General Information

VAADR-SFF-CAN provides real-time recording of 2 channels (cascadable to 4 with a cable to another VAADR SFF-CAN) full frame-rate 16-bit hi-resolution raw Bayer imagery from 2 sensors/cameras, in vehicular applications, or in the lab or other industrial setting. It can record RAW Bayer imagery, and associated vehicular meta-data (GPS, timestamp, CAN, etc.). The RAW imagery recording and associated playback allows unprecedented advanced image analysis and processing during debriefing or post mission analysis. It provides multiple channels, a variety of conventional VCR type controls, bookmarks, and a mix of very advanced image analysis and processing during playback. Additionally, it handles metadata acquisition, synchronization, management, and display







Specs

Interfaces / Specs

Image

- 2 channels of Omnivision OV10635 or equivalent. Adaptable to others.
- LVDS. 16 bits/pixel, RGGB Bayer, RCCC, other
- 492Mbits/sec
- FAKRA Type Z connector
- Power over Coax

Vehicle Data

- 1 high speed CAN2.0, 1 low speed CAN2.0
- DB-9 physical interface, both channels
- Data skew to video: < 100 ms
- Data stored in video header (speed, yaw, yaw rate, GPS, time, gear position, steering angle, etc.)
- Adaptable to other codebooks

Video Storage / Extraction

- 2 750GB spinning drives, or 2 500GB SSD drives (other drives available)
- 2 channels of approximately 3.4 hrs for 750GB.
- Stored as Bayer mosaic
- Video monitoring during storage out DVI/ HDMI at 30 fps from selected camera source
- Console button for VCR controls start/stop, and bookmark insertion
- Video extraction over USB2.0, or directly view data on drive with VAADRView or other
- Extra serial port for synchronizing this recorder to other VAADR recorders, for 4 or 6 simultaneous video records.

Environmental / Physical

Storage: -40 °C to +85 °C Spinning drives: -25 °C to 70 °C Solid state drives: 0°C to 60 °C Dimensions: 7"x4"x2.5" Power: 12VDC (8V-16V DC), < 25W Weight: 3.5 lbs

Front Panel



Back Panel



Expansion

Extra hardware and ports exist. With effort, the following functionality could be added:

- Network access
- 3rd CAN port
- Cameralink camera input
- Sensor Tx outputs. This can be used to play the recorded video later out 2 output jacks, to look like the live camera feeds that came in upon record
- Console button for VCR controls start/stop, and bookmark insertion
- Video extraction over USB2.0, or directly view data on drive with VAADRView or other







Control

VAADK SFF-CAN

VAADR Simple Control GUI

An application that is used to control VAADR to record, stop, drop bookmarks, and gather VAADR status. It is meant to run on a laptop inside the vehicle to initiate the desired operations.

It implements the VAADRLink protocol, which can be provided in some circumstances, if you wish to write your own control application.

| A VAADR Simple C | ontrol Interface | - 🗆 X | | | | |
|--|--------------------------------------|--------------------|--|--|--|--|
| File Help | | | | | | |
| VAADR state | Bookmark Recor | rd Stop | | | | |
| rec live | • • | | | | | |
| | SPACE Q | S | | | | |
| Drive usage | Display From Camera 1 Camera 2 | Reset Recording | | | | |
| Time | | | | | | |
| Get Time Get VAADR | | | | | | |
| Set Time 2016-03-09 13:14:19 | | | | | | |
| [Stopped] [Camera 1 recorded, Camera 1 displayed] [usage=empty] | | | | | | |
| 13:11:42 No COM port open! | | | | | | |



An application that is a playback/debrief PC GUI to view/process large amounts of VAADR recorded video. It also shows the vehicle track/position over map/satellite data for any frame of video.

- Video: Instant access to any amount of video from your VAADR, from your PC, or from your network storage. Load multiple videos simultaneously. Export to other formats. Extract interesting sections.
- Video Formats: Reads RAW Bayer, RAW grayscale, MPEG-2, AVI, jpg, BMP, GIF, png, tiff. Writes JPG, BMP, GIF, and AVI with available codecs on your PC.
- **Bookmarks**: Add bookmarks for quick indexing. Multiple people can have their own sets for the same video. Extract video of bookmarks.
- Data: Study images, video, histograms, hex data, CAN data, or PixelText (see next page).
- **Mapping**: Show vehicle GPS track and position data over satellite or map imagery (see next page), in real time during playback of stored video.
- **Processing**: Zoom, AGC, sharpen, color adjustments, rotation, flipping, etc.







VAADRView Mapping



SFE-CAN

VAADRView Analysis

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| SFF-VAADR-CAN- | 353 0050 0037 0028 0034 | | 0037 0035 003f | 0044 0067 | 0042 0056 003c 0034 | Zoom Histogram |
| 0_201604051102-000- 000.raw | 0066 0079 0043 0040 | 6 0056 008b 005d (| 0065 0066 008d | 0081 00a0 | 007e 008d 0071 0067 | x=436 y=372 Zoom |
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| | | | | | 03dc 02ff 0067 0046 | |
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| | 0357 03fd 03fd 03fd | | | | | 03ff |
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| | 03fd 03fe 03fd 03fe | | | 026f 02af | | |
| | 03ff 03fc 03ff 03fc 03fd 03fd 03fd 03fd | | | | 0118 0334 01d2 02f7 0137 01d8 0210 02f0 | |
| | 03ff 03fd 03ff 03f | | 01a8 00ce 02bd | | 02ed 03ff 03fa 03ff | 03f7 |
| | 03fd 03fe 03fd 03fe | | | | 039b 03ff 03c6 03ff | |
| | 03FF 03Fd 03FF 03Fe | | | 03£9 03££ | 03ee 03ff 03ff 03ff | |
| | ■ 03fd 03fd 0271 020a | | 0353 02f7 03fe | 0135 0127 | 00b6 0102 00bf 00fc | Plugins MetaData Annotations |
| 4 | 03fe 03fe 01e4 015: 02c1 0270 00c9 011 | | 03ff 03ff 03ff 03fb 0345 03f7 | | 003c 0055 0041 0055 0034 003a 0032 0039 | 10/5/2015, 11:02:44.64 Laser |
| | | 0352 03ff 03fa | | | 003d 004d 0032 0037 | CAN data VID=61166 CID=56797 |
| | 00d1 00d8 00 00 02f | f 039d <mark>03ff 03c9</mark> (| 03ff 03bb 03f3 | 00b6 0055 | 0030 0043 0032 002E | LAT LONG g = 0 m/s^2 |
| | 00b7 0284 024d 03fe | | | | 0039 004b 0034 0033 | LONG LAT g = 0 m/s^2 |
| | | c 03e6 03ff 03fe c 03f9 03fc 03ff | | | 0035 0042 0032 002d 0042 0059 0036 0030 | ALT RPM = 0 Truth Data |
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| | / | | | | , | |

SFF-CAN

Reference image Reference image

See the VAADR view product sheet for more details CAN data. Can be tuned to desired data: GPS, time, steering angle, brake pedal, gas pedal, etc.



