VAADR SFF-CAN

DIGITAL DESIGN CORPORATION

Advanced Video and Data Vehicular Recorder

Features and Capabilities

- 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

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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

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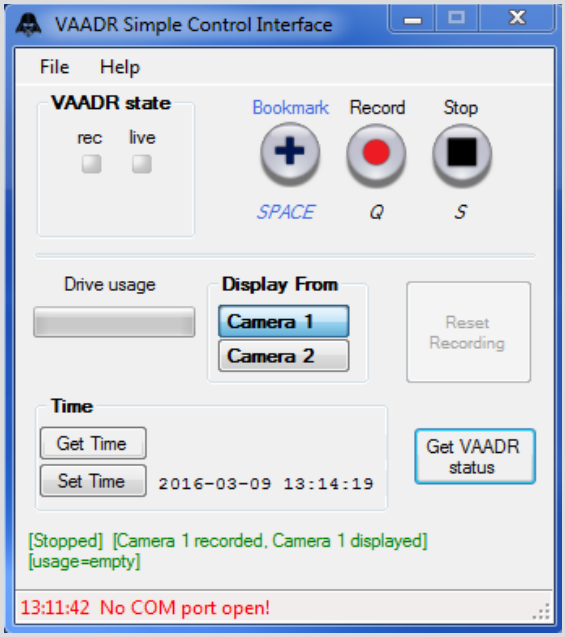
VAADR Control

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.



VAADR View

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.

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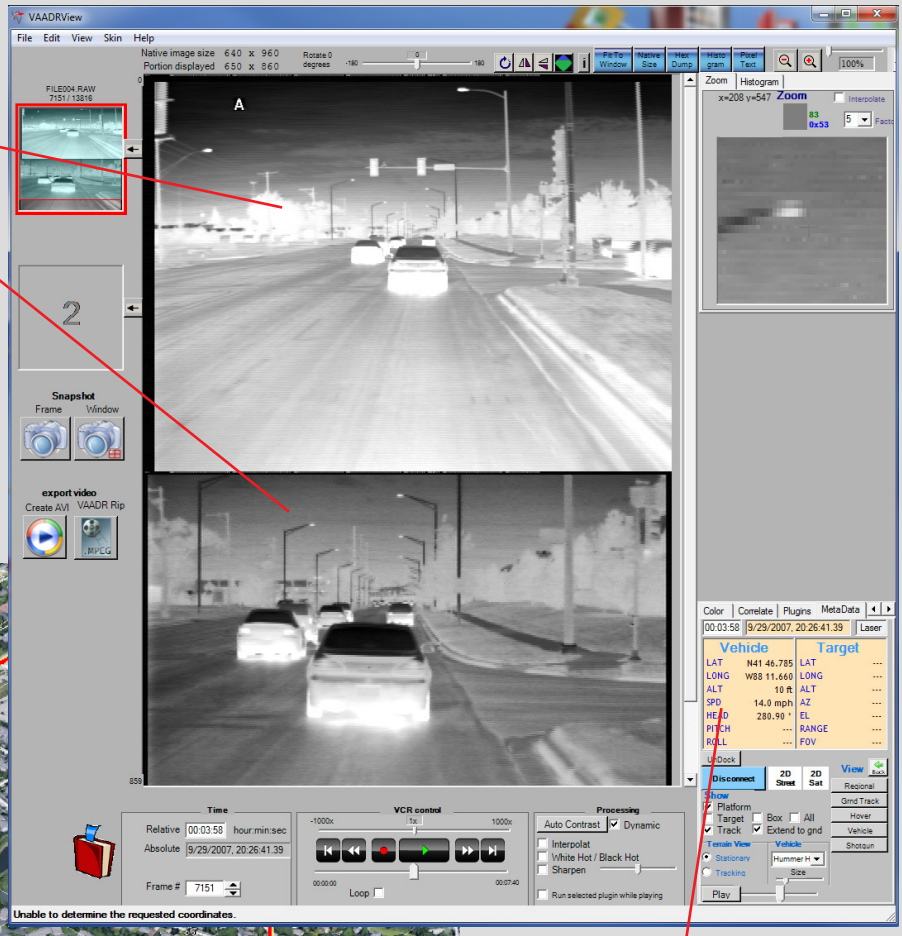
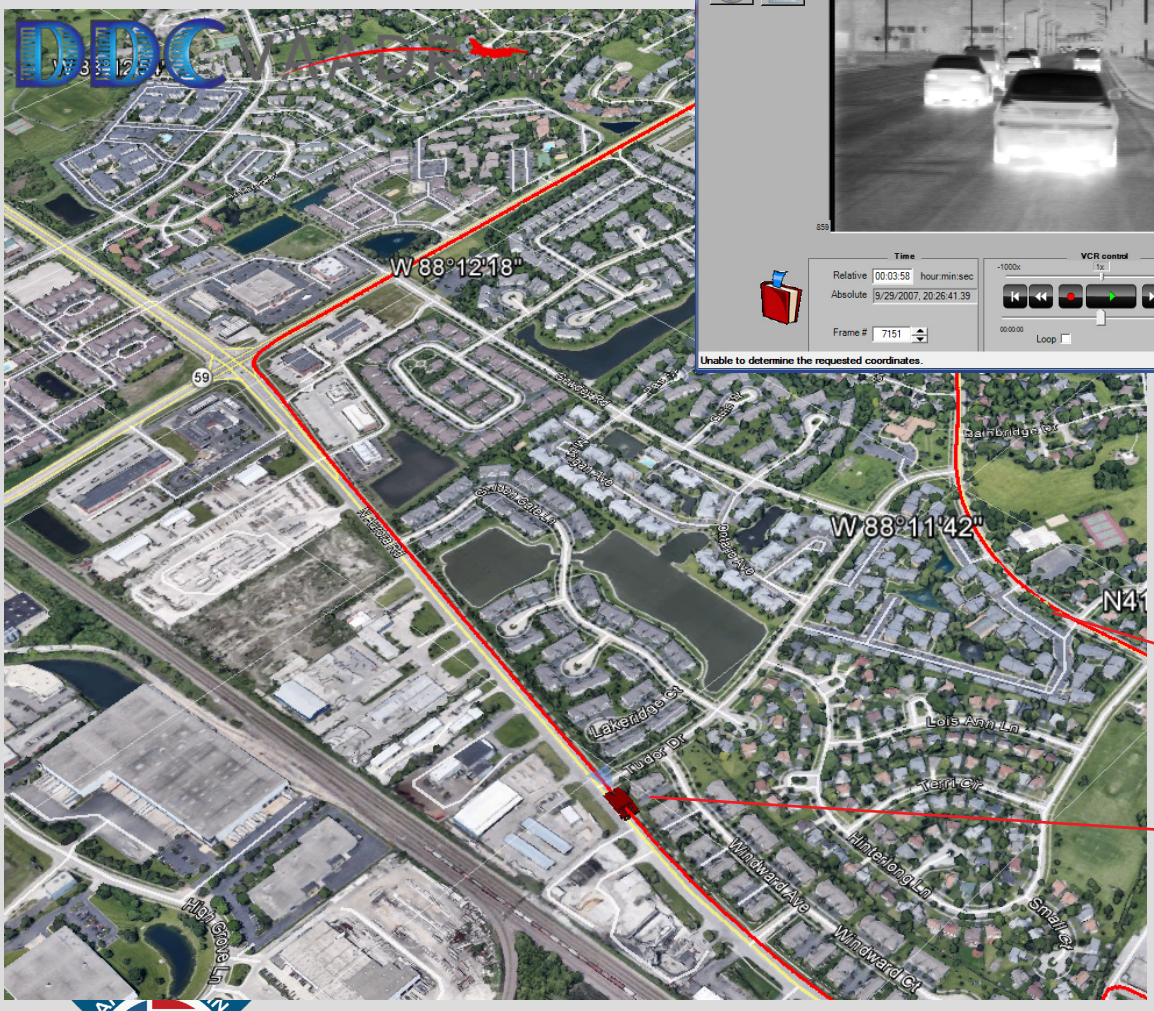
VAADRView Mapping

2 cameras



See the VAADRView product sheet for more details



Metadata, including CAN

Corresponding video track for whole video

Vehicle position of current frame of video

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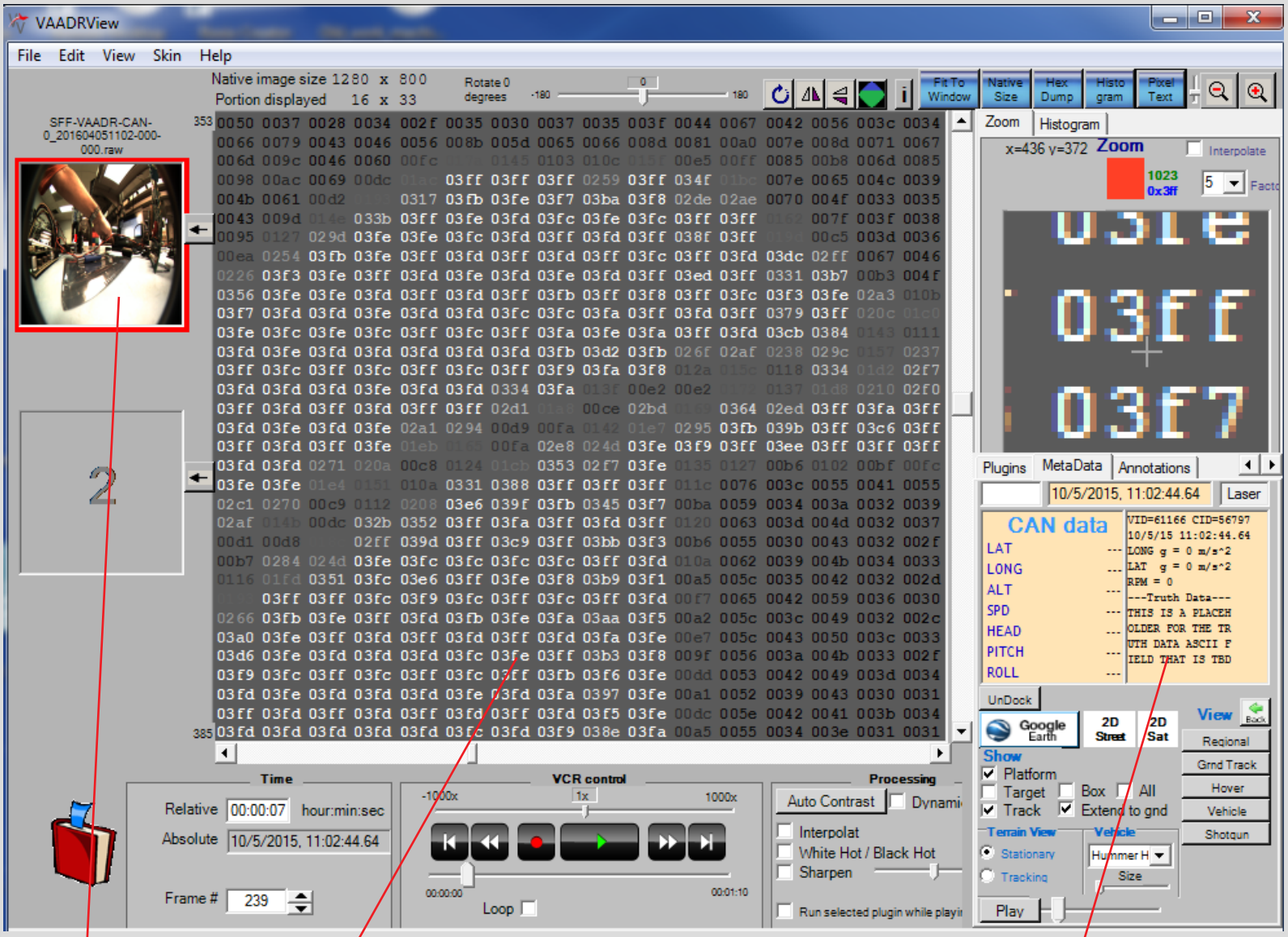
VAADRView Analysis



Reference image

This window normally displays video, but can selectably show the raw pixel values: PixelText showing RAW Bayer data values. Graphically, this is in the same position as the actual pixels shown above and in the selected portion of the reference image. It can be panned around throughout the image

CAN data. Can be tuned to desired data: GPS, time, steering angle, brake pedal, gas pedal, etc.

See the VAADRView product sheet for more details

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