

**STACK  
STACK  
STACK®**

# Motorsport DVRs

Stack's new range of Digital Video Recorders combine ruggedness, reliability and recording quality with a slim, lightweight design that's perfect for all motorsport competitors and trackday enthusiasts.

- Solid-state, no moving parts, ensuring reliable operation year after year.
- Fully waterproof unit (PRO-4 model).
- Records MPEG2 video to removable CF card, playable on PC or burn directly to DVD.
- 3 or 4 fully configurable camera inputs.
- Up to 720x576 resolution @ 25 fps (PAL) or 720x480 @ 30 fps (NTSC).
- Widescreen 16:9 and 4:3 aspect ratios.
- User configurable bit-rate up to 12 Mbps.
- Broadcast quality versions available (up to 50 Mbps).
- Up to 9 hours of highest quality, full resolution recording.
- 2 channel audio recording.
- Automatic record start/stop using built-in 3-axis g-sensor.
- 9-20V DC powered, 5 Watts, suitable for all motorsport applications.
- Optional GPS and vehicle data overlays.

Stack's digital video recorders employ broadcast standard MPEG-2 video compression to record high quality real-time video and audio direct to a Compact Flash (CF) card. The card can be removed with ease and played on a PC or laptop using a standard media player application. Recordings can be archived direct to DVD for playback on either a PC or a DVD player.

## Powerful features as standard

Stack's range of DVRs all include the option to record in both 16:9 (Widescreen) and 4:3 aspect ratios. All models in the range feature an in-built 3-axis accelerometer, to enable automatic recording start/stop based on movement or acceleration of the vehicle.

## Enhanced range with multi-camera processors built-in

Newly launched is an enhanced range of DVRs with built in multi-camera processors. Simple to use PC software enables you to create your own multi-camera screen layout, positioning, cutting, cropping and scaling individual camera images as required. Unlike some other systems, our multi-camera Starter Kits are supplied with only high quality cameras, so that you can maintain each picture-in-picture at full resolution if desired, while cropping it to show only the area of interest, without loss of quality.

## Ruggedised to withstand the rigours of Motorsport

Stack DVRs are housed inside a rugged, machined aluminium housing, specifically designed and manufactured to protect the unit from motorsport environments. Its anti-vibration and shock-resistant abilities make Stack DVRs uniquely resistant to the extreme conditions encountered in all forms of Motorsport.

## Available in models to suit your needs...



## PRO-4 DVR

Intended for the most demanding motorsport applications, especially in wet and/or high vibration environments, the PRO-4 DVR is a fully waterproof unit, utilising 3 Motorsport AS connectors. Being a fully waterproof unit, and operating from 0-60°C, the PRO-4 DVR is ideally suited for all types of motorsport, from Formula 1 to karts, bikes to boats, and many more applications. The PRO-4 DVR supports recording bit-rates up to 12 Mbps - higher quality than commercial DVD's.

The PRO-4 DVR has 4 camera inputs. Using the supplied drag-and-drop PC configuration software, the recorded image can be made up of any combination of the 4 camera input images.

**4 camera inputs**

**8 Fixed Bit-rates (1 Mbps Min. 12 Mbps Max.)**

**11-136 Mins/Gbyte @ full resolution**

**0 to 60°C (32 to 140°F) operating temp. range**

**32 GB maximum card size**

**9 to 20V DC powered**

**Waterproof**

**2 x 9W DDAS, 1 x 5W AS**

**External Status LED**

## Clubman-3 DVR

The Clubman-3 DVR is perfect for all forms of club and semi-professional motorsport that do not require a waterproof unit. The Clubman-3 DVR offers high-performance coupled with outstanding reliability yet is exceptional value for money. The Clubman DVR supports bit rates up to 10 Mbps.

The Clubman-3 features up to 3 camera inputs. Using the supplied drag-and-drop PC configuration software, the recorded image can be made up of any combination of the 3 camera input images.

**3 camera inputs**

**7 Fixed Bit-rates (1 Mbps Min. 10 Mbps Max.)**

**14-136 Mins/Gbyte @ full resolution**

**0 to 50°C (32 to 122°F) operating temp. range**

**32 GB maximum card size**

**9 to 20V DC powered**

**Not Sealed**

**15 W "D" connector, 3.5mm AV jack, Micro-USB**

**External Status LED**



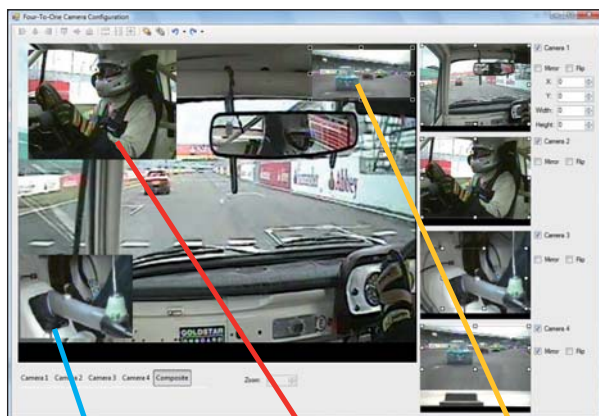
Each Stack DVR comes complete with harnesses (including camera and mic power outputs), record control switch and status lamp. The externally visible LED status lamp indicates record status, CF card "free memory" status and common error conditions. A comprehensive manual is included with full instructions and wiring diagrams to ease installation and use.

## Multi-Camera Screen Display

Stack's multiple camera DVRs capture the whole story. Multiple camera angles add significantly to the awareness you have about your driving, the vehicle's performance and other vehicles around you.

Both the Clubman-3 and PRO-4 DVRs incorporate built-in multi-camera processors that allow any format of multiple PAL or NTSC cameras (up to 3 or 4 inputs, depending on model) to be recorded simultaneously with configurable scaling, crop, mirror, flip and positioning of each picture. Unlike other systems, picture-in-picture can be recorded at full resolution, or larger if desired.

Stack's multiple camera input DVRs give the user full control over all screen elements. Together with comprehensive recording set-up using the DVR Configuration Utility, standard across all models, the advanced Custom Display Utility provides complete control of each picture's size, position, picture cropping and position.



Crop

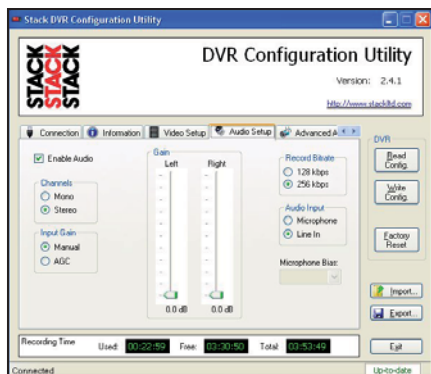
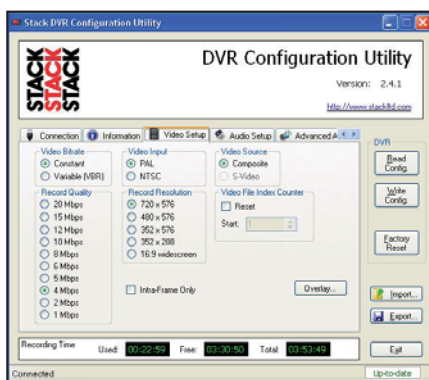
Resize

Mirror

The easy-to-use software utilises a simple click and drag interface to set up how each input channel is displayed.

## DVR CONFIGURATION SOFTWARE

Standard across all models in the Stack DVR range is a PC-based Configuration Utility which offers comprehensive flexibility and control over the DVR's operation including video and audio recording quality selection.



Also configurable is Record Control (how the DVR will respond to the Record Switch) and On-screen Display formatting.

## Data Overlay Options

### GPS & G-FORCE DATA OVERLAY OPTION

The GPS and G-force Data Overlay option can be added to your DVR. Simply plug in the optional GPS receiver and speed, position, altitude, time and date information can be overlaid on the recorded video image, along with the lateral-, long- and vertical-g data from the internal 3-axis accelerometer.



Positioning the data on the image is simple, using the drag-and-drop PC configuration software.

### VIDEO DATA OVERLAY EXPANSION SYSTEM

The Stack Video Data Overlay Expansion System transforms your DVR and existing Stack Display or Steering Wheel System and DVR into a powerful data logging system without the need for a PC.

Real-time performance data is overlaid on the video picture along with engine parameters and driver activity channels. You can now see your RPM, speed, gear, throttle angle and brake pressure for every point on the track. Note your maximum speeds in the straights and minimum speeds through each corner. And our patented Performance Meter and Predicted Lap Time displays enable you to see exactly where time has been gained or lost on the track, compared to the fastest lap to date.

The Video Data Overlay Expansion System connects between the camera and the DVR. A second connection is required to any existing Stack Display or Steering Wheel System (ST8100, ST8130, ST8110SR, ST8600 etc.). This provides power for the system and data for RPM, Speed, 2 temperatures, 2 pressures, and lap times\*. Internally generated channels are lateral and long g's, battery volts, lap number, best lap time, Performance Meter and Predictive Lap Time\*.



\*Requires appropriate sensors to be connected to existing Stack Display System.

## Kits, Cameras & Accessories

### DVR STARTER KITS

Stack's DVRs for Motorsport range are available separately or as part of Starter Kits that contain all you need to get started out of the box. All starter kits include the specified number of cameras, sensitive microphone, remote control record switch, record status LED, wiring harness, PC configuration software and PC configuration cable.



- PRO 1-Camera DVR Starter Kit includes PRO-4 DVR and 1 camera.
- PRO 2-Camera DVR Starter Kit includes PRO-4 DVR and 2 cameras.
- PRO 3-Camera DVR Starter Kit includes PRO-4 DVR and 3 cameras.
- PRO 4-Camera DVR Starter Kit includes PRO-4 DVR and 4 cameras.



- Clubman 1-Camera DVR Starter Kit includes Clubman-3 DVR and 1 camera.
- Clubman 2-Camera DVR Starter Kit includes Clubman-3 DVR and 2 cameras.
- Clubman 3-Camera DVR Starter Kit includes Clubman-3 DVR and 3 cameras.

### CAMERAS & MICROPHONES

Stack's high-resolution miniature bullet cameras and amplified microphones provide the highest quality video and audio signals, to match the recording high quality of Stack's Digital Video Recorder range. They are available as part of the Starter Kits above or can be obtained as accessories.



- High quality 560 line CCD camera provides maximum quality.
- Auto-iris and auto-white balance compensates for varying sun & light conditions.
- Performs well in low light conditions; down to 0.2 lux @ F2.
- Camera is sealed for all weather conditions.
- Different lens options available.
- PAL or NTSC options available.
- Amplified microphone (line level output) minimises electrical interference.

## Specifications

	DVR-4 PRO	CLUBMAN-3 DVR
<b>GENERAL</b>		
Mechanical Size	151 x 76 x 21mm	151 x 76 x 21mm
Finish	Hard Anodised Al	Hard Anodised Al
Weight	380g without card	380g without card
Operating Voltage Range	9V to 20V DC	9V to 20V DC
Power Consumption:	~5W	~5W
Connectors	2 x 9W DDAS, 1 x 5W AS	15 W "D", 3.5mm AV Jack, Micro-USB
<b>ENVIRONMENTAL*</b>		
Operating Temp. Range	0 to 60°C (32 to 140°F)	0 to 50°C (32 to 122°F)
Sealing	Waterproof	Not sealed
<b>STORAGE MEDIUM</b>		
Storage Medium	Compact Flash	Compact Flash
Maximum Card Size	32GB	32GB
File Format	MPEG-2; Windows Media Player & DVD compatible	MPEG-2; Windows Media Player & DVD compatible
<b>RECORDING - VIDEO</b>		
Number of video inputs	4	3
Video Standards Supported	PAL/NTSC	PAL/NTSC
Video input multiplexing options	Any format of 1 to 4 cameras on one screen (with programmable scale, mirror, crop and position)	Any format of 1 to 3 cameras on one screen (with programmable scale, mirror, crop and position)
Composite Video Input	Composite 1V pk-pk	Composite 1V pk-pk
Video Frame Rate	PAL 25fps; NTSC 30 fps	PAL 25fps; NTSC 30 fps
Video Monitor Output	1 V pk-pk Composite	1 V pk-pk Composite
Compression Format	MPEG-2	MPEG-2
Resolutions Supported	16:9 Widescreen, D1; 2/3D1; 1/2D1, SIF	16:9 Widescreen, D1; 2/3D1; 1/2D1, SIF
Quality - bitrate (at D1 resolution)	8 Fixed Bit-rates (1 Mbps Min. 12 Mbps Max.)	7 Fixed Bit-rates (1 Mbps Min. 10 Mbps Max.)
CF Record Time (at D1 Resolution)	11 to 136 Mins/Gbyte	14 to 136 Mins/Gbyte
<b>RECORDING - AUDIO</b>		
Number of channels	2	2
Input Level	Line Level +3 to -30dB	Line Level +3 to -30dB
Input Impedance	> 10k Ohms	> 10k Ohms
Audio Monitor Output	0dB (nominal)	0dB (nominal)
Audio Monitor Output Impedance	<100 Ohms	<100 Ohms
<b>MISCELLANEOUS</b>		
Power up to Record start time	<20 Sec	<20 Sec
Record Switch to Record start/stop time (in powered up state)	<0.1 Sec	<0.1 Sec
Lost recording time between 2GB files	None	None
Max video loss if power lost while recording	<last 1 Sec.	<last 1 Sec.
Configuration	Via USB	Via USB
<b>DATA OVERLAY</b>		
GPS/G-force Data	Option	Option
Overlay		
Real-time Performance Data Overlay	Expansion System Option (requires Stack Display/Steering wheel System)	Expansion System Option (requires Stack Display/Steering wheel System)

\*Specifications quoted dependent on use of appropriate CF cards and are guaranteed only with Stack supplied Harsh Environment cards.