

Features

- Stand-alone data recorder for mobile applications
- 512 MBytes of memory, with data retention in case of power loss
- 16 external inputs: analog, frequency, counters or state
- 5 internal sensors:
 - 3 internal accelerometers: $\pm 2G$ or $\pm 6G$.
 - Internal Temperature.
 - Supply Voltage
- 3 Vehicle data bus ports
 - CAN1: CAN 2.0a/b (HS-CAN)
 - CAN2: CAN 2.0a/b (HS-CAN – see other options below)
 - SAE-J1708/SAE-J1587
- 3 RS-232 serial ports (COM)
- Compatibility with:
 - COMGPS - GPS receiver with antenna
 - COMEVD - CDMA cellular network transceiver
 - COMETH - Ethernet communication module
 - COMBLU - Bluetooth radio transceiver
 - COMMH1 - 900 MHz long range radio transceiver.
 - COMGSM - GPRS (GSM) cellular network transceiver.
 - COMWFI - Wi-Fi communication module
 - COMMTX - MineTrax battery-powered wireless mesh network modem
 - VDPMOD-OBD - Connect to all OBD compatible vehicle data bus (J1850PWM, J1850VPW, ISO9141-2, ISO 14230 KWP, ISO15765 - CAN)
- Recording triggered by input - automatic start/stop
- Sampling rate up to 4 kHz for all external channels.
- 1 USB 2.0 full-speed port.
- Low power consumption and auto shutdown
- Small size, light weight, rugged anodized aluminum enclosure resistant to petroleum products.
- Built-in overvoltage protection circuit
- Vibration Lock™ connector, no tools required
- MIL-STD-810F, CE and IP65 certified


Installation
Hardware setup:

- Attach the Recorder to the vehicle chassis using Dual-Lock™ Velcro
- Position the Recorder such that the three LEDs indicating the system status are visible
- Align the Recorder's X, Y and Z axis along the lateral, longitudinal and vertical orientation of the vehicle
- Use the main recorder harness (HRNMN2-318) to connect the Recorder to the power supply and peripherals
- Use the sensor harnesses (HRNSEN-B and HRNSEN-C) to connect the Recorder to the sensors/detectors

Software Configuration:

Use Analyzer V9 software to configure or retrieve data from the Recorder.

Calibration

The calibration data for the three internal accelerometers is supplied with the Recorder

Options

OPTVD2	Vehicle Data bus option 2
	– CAN1: CAN 2.0a/b (HS-CAN)
	– CAN2: CAN 2.0a/b (FT-CAN)
	– SAE-J1708/SAE-J1587
OPTVD3	Vehicle Data bus option 3
	– CAN1: CAN 2.0a/b (HS-CAN)
	– CAN2: CAN 2.0a/b (SW-CAN)
	– SAE-J1708/SAE-J1587

Specifications

Description	Symbol	Min	Typ	Max	Unit
VDP (Vehicle Data and Power)					
Input voltage	V_{in}	10.0		30.0	V
Input current @ 12.0V ¹	I_{in-12}		75		mA
Input current @ 24.0V ¹	I_{in-24}		53		mA
VDP HSCAN (TI SN65HVD1050D)					
Bit Rate	BR_{HSCAN}	10		1000	Kbit/sec
DC voltage at pin CANH/CANL	V_{HSCANH}/V_{HSCANL}	-27		40	V
Transient voltage at pin CANH/CANL	$V_{tHSCANH}/V_{tHSCANL}$	-200		200	V
VDP J1708 Interface (National DS36277)					
Bit rate	BR_{J1708}		9.6		kbit/sec
DC voltage at pin A	V_{J1708A}	-10		15	V
DC voltage at pin B	V_{J1708B}	-10		15	V
Internal accelerometer					
±2G resolution X, Y and Z	$ACCRES_{XYZ2G}$		0.00195		g/bit
±6G resolution X, Y and Z	$ACCRES_{XYZ26}$		0.00586		g/bit
0G level	$ACCZGL_{XYZ}$		1.25		V
non-linearity X, Y, Z	$ACCNL_{XYZ}$		±2		%FS
bandwidth X, Y and Z	$ACCBW_{XYZ}$		10		Hz
Internal temperature sensor					
Accuracy over measuring range	ACC_{TMP}		±2		C
Resolution	RES_{TMP}		0.12207		C/bit
A group (A1-A8)					
Output voltage ²	V_{ExtIn}	$V_{in}-0.6$		V_{in}	V
Total output current – group A1-A4 ³	I_{ExtIn}			170	mA
Total output current – group A5-A8 ³	I_{ExtIn}			170	mA
Sampling rate per input	$SAMP_{ExtIn}$	1/600		4000	Samp/sec
<u>Frequency, state, counter mode:</u>					
Digital input low voltage ⁴	DTC_{Lo}	-35		2.4	V
Digital high voltage ⁵	DTC_{Hi}	2.6		35	V
Internal pull-up resistor	R_{pup}		3		MΩ
Input capacitance	C_{DTC}		1.7		pF
Input frequency	F_{DTC}	0.7		1000	Hz
Counter resolution	RES_{DTC}		5.3333		us
<u>Analog mode:</u>					
Analog input voltage ⁶	SIG_{SENA}	0		5.0	V
Analog input voltage tolerance ⁷	$VTOL_{SENA}$	-35		35	V
Analog input accuracy	ACU_{SENA}		±0.025		%FS
Input capacitance	C_{SENA}		1.7		pF
A/D converter resolution	ADR_{SENA}		1.221		mV/bit
A/D conversion time per chan.	ADT_{SENA}	7		14	us
A/D conv. time all SENA chan.	$ADTA_{SENA}$	14		28	us
A/D conv. frequency	$ADTF_{SENA}$	8.928		17.85	kHZ
COM group					
Output voltage	V_{COM}	$V_{in}-0.6$		V_{in}	V
Total output Current	I_{COM}			500	mA
Regulated output voltage	$V_{COM-REG}$	4.75		5.25	V
Regulated output current	$I_{COM-REG}$			500	mA
Control output voltage	V_{CTL}	0		5	V

¹ Recorder with no sensor attached

² Voltage supplied by the Recorder to the given sensor or detector group.

³ Maximum current before the auto-reset fuse interrupts supply to the given external sensor or external detector group.

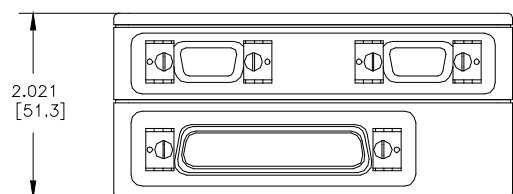
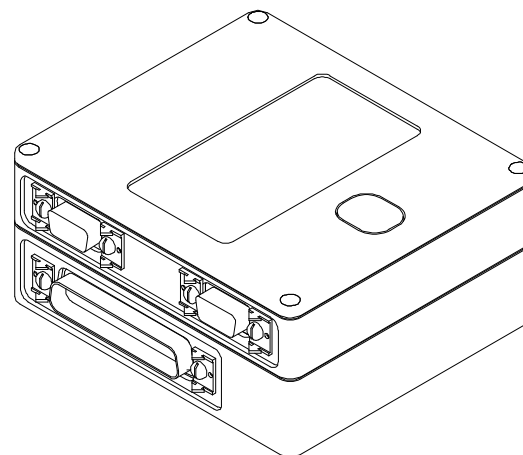
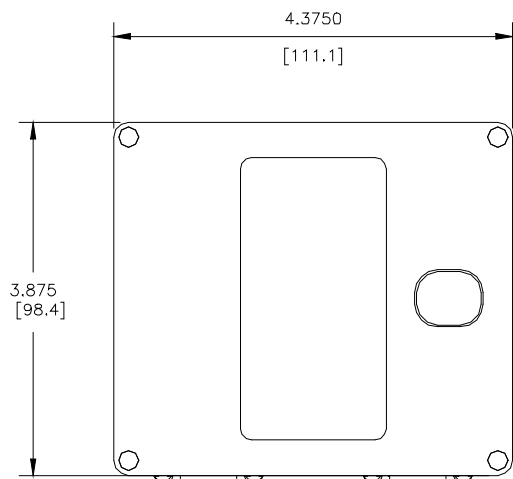
⁴ Single-ended voltage for each detector input.

⁵ Single-ended voltage for each detector input.

⁶ Single-ended voltage for each sensor input

⁷ Single-ended voltage tolerance without damaging the unit

Description	Symbol	Min	Typ	Max	Unit
B & C group (B1-B4, C1-C4)					
Output voltage ²	V_{ExtIn}	$V_{in}-0.6$		V_{in}	V
Total output current – group B1-B4 ³	I_{ExtIn}			170	mA
Total output current – group C1-C4 ³	I_{ExtIn}			170	mA
Sampling rate per input	$SAMP_{ExtIn}$	1/600		4000	Samp/sec
<u>Frequency, state, counter mode:</u>					
Digital input low voltage ⁴	DTC_{Lo}	-35		2.4	V
Digital high voltage ⁵	DTC_{Hi}	2.6		35	V
Internal pull-up resistor	R_{pup}		3		MΩ
Input capacitance	C_{DTC}		1.7		pF
Input frequency	F_{DTC}	0.7		1000	Hz
Counter resolution	RES_{DTC}		5.3333		us
<u>Analog mode:</u>					
Analog input voltage ⁶	SIG_{SENBC}	0		5.0	V
Analog input voltage tolerance ⁷	$VTOL_{SENBC}$	-35		35	V
Analog input accuracy	ACU_{SENBC}		±0.040		%FS
Input capacitance	C_{SENBC}		1.7		pF
A/D converter resolution	ADR_{SENBC}		0.3		mV/bit
A/D conversion time per chan.	ADT_{SENBC}		1.6		us
A/D conv. time all SENB & SENC chan.	$ADTA_{SENBC}$		3.7		us
A/D conv. Frequency	$ADTF_{SENBC}$	270		625	kHZ
A/D sampling type	$SAMPT_{SENBC}$		Simultaneous		
IDN (ISAAC Device Network)					
Output voltage	V_{IDN}	$V_{in}-0.6$		V_{in}	V
Total output current	I_{IDN}			500	mA
IDN HSCAN (TI SN65HVD1050D)					
Bit Rate	BR_{HSCAN}	10		1000	KBbit/sec
DC voltage at pin CANH/CANL	V_{HSCANH}/V_{HSCANL}	-27		40	V
Transient voltage at pin CANH/CANL	$V_{tHSCANH}/V_{tHSCANL}$	-200		200	V
IDN FTCAN Interface (Motorola MC33388) (Option OPTVD2)					
Bit rate	BR_{FTCAN}	10		125	KBit/sec
DC voltage at pin CANH/CANL	V_{FTCANH}/V_{FTCANL}	-20		27	V
Transient voltage at pin CANH/CANL	$V_{tFTCANH}/V_{tFTCANL}$	-40		40	V
IDN SWCAN Interface (Philips AU5790) (Option OPTVD3)					
Bit Rate	BR_{SWCAN}	10	33	100	Kbit/sec
DC voltage at pin CANH	V_{SWCANH}	-10		18	V
Transient voltage at pin CANH	$V_{tSWCANH}$	-100		100	V
Effective download throughput					
USB			530		KBytes/sec
COM1, COM2, COM3 (RS-232)			10		kBytes/sec
Environment					
Operating temperature	T_o	-40 (-40)		85 (185)	C (F)
Storage temperature	T_s	-40 (-40)		85 (185)	C (F)
Certifications					
Electromagnetic Compatibility	CE				CE Mark
IP (Ingress protection) (IEC 60529)	IP 65				IP 65 (dust & water resistant)
Environmental (military spec.)	MIL-STD 810F MIL-STD 810F MIL-STD 810F MIL-STD 810F MIL-STD 810F IEC 68-2-52				501.4 (low temperature) 502.4 (high temperature) 507.4 (humidity) 514.5 (vibration) 516.5 (mechanical shock) Resistance to Cyclic Salt Spray
Mechanical Specifications					
Height			51.3 (2.02)		mm (in)
Depth			98.4 (3.875)		mm (in)
Width			111.1 (4.375)		mm (in)
Weight			508 (17.92)		g (oz)



All dimensions are in inches [millimeters].