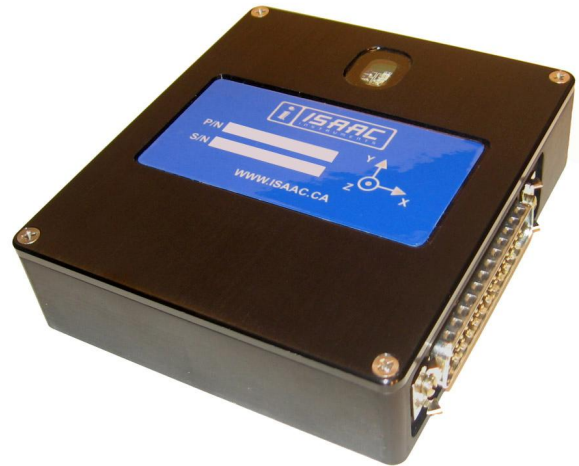


**Features**

- Stand-alone data recorder for mobile applications
- 512 MBytes of memory, with data retention in case of power loss
- 8 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


**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

**Software Configuration:**

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

**Options**

<b>OPTVD2</b>	<b>Vehicle Data bus option 2</b> <ul style="list-style-type: none"> <li>– CAN1: CAN 2.0a/b (HS-CAN)</li> <li>– CAN2: CAN 2.0a/b (FT-CAN)</li> <li>– SAE-J1708/SAE-J1587</li> </ul>
<b>OPTVD3</b>	<b>Vehicle Data bus option 3</b> <ul style="list-style-type: none"> <li>– CAN1: CAN 2.0a/b (HS-CAN)</li> <li>– CAN2: CAN 2.0a/b (SW-CAN)</li> <li>– SAE-J1708/SAE-J1587</li> </ul>

**Calibration**

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

**Specifications**

Description	Symbol	Min	Typ	Max	Unit
<b>VDP (Vehicle Data and Power)</b>					
Input voltage	$V_{in}$	10.0		30.0	V
Input current @ 12.0V <sup>1</sup>	$I_{in-12}$		75		mA
@ 24.0V <sup>1</sup>	$I_{in-24}$		53		mA
<b>VDP HSCAN (TI SN65HVD1050D)</b>					
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
<b>VDP J1708 Interface (National DS36277)</b>					
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
<b>Internal accelerometer</b>					
±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
<b>Internal temperature sensor</b>					
Accuracy over measuring range	$ACC_{TMP}$		±2		C
Resolution	$RES_{TMP}$		0.12207		C/bit
<b>A group (A1-A8)</b>					
Output voltage <sup>2</sup>	$V_{ExtIn}$	$V_{in}-0.6$		$V_{in}$	V
Total Output current per group <sup>3</sup>	$I_{ExtIn}$			170	mA
Sampling rate per input	$SAMP_{ExtIn}$	1/600		4000	Samp/sec
<u>Frequency, state, counter mode:</u>					
Digital input low voltage <sup>4</sup>	$DTC_{Lo}$	-35		2.4	V
Digital high voltage <sup>5</sup>	$DTC_{Hi}$	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 <sup>6</sup>	$SIG_{SENA}$	0		5.0	V
Analog input voltage tolerance <sup>7</sup>	$VTOL_{SENA}$	-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
<b>COM group</b>					
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

<sup>1</sup> Recorder with no sensor attached

<sup>2</sup> Voltage supplied by the Recorder to the given sensor or detector group.

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

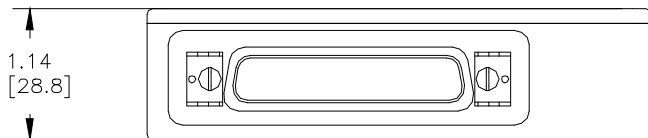
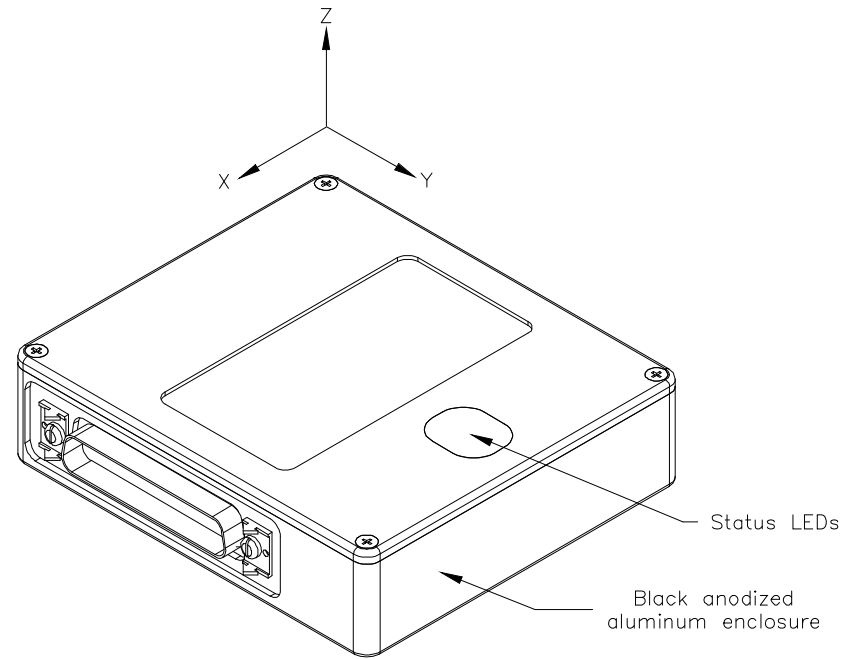
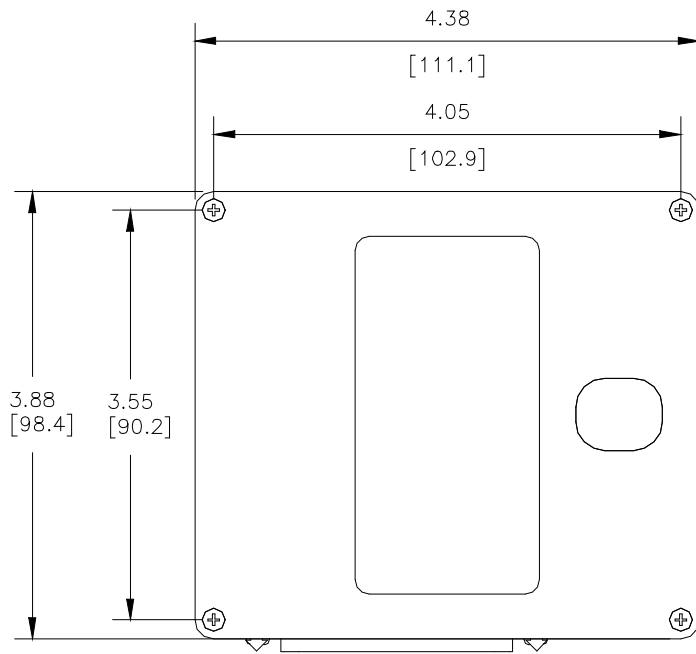
<sup>4</sup> Single-ended voltage for each detector input.

<sup>5</sup> Single-ended voltage for each detector input.

<sup>6</sup> Single-ended voltage for each sensor input

<sup>7</sup> Single-ended voltage tolerance without damaging the unit

Description	Symbol	Min	Typ	Max	Unit
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	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
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 & waterproof)			
Environmental (military spec.)	MIL-STD 810F	501.4 (low temperature)			
	MIL-STD 810F	502.4 (high temperature)			
	MIL-STD 810F	507.4 (humidity)			
	MIL-STD 810F	514.5 (vibration)			
	MIL-STD 810F	516.5 (mechanical shock)			
	IEC 68-2-52	Resistance to Cyclic Salt Spray			
Mechanical Specifications					
Height			28.8 (1.14)		mm (in)
Depth			98.4 (4.00)		mm (in)
Width			111.1 (4.38)		mm (in)
Weight			260 (9.17)		g(oz)



All dimensions are in inches [millimeters].