

Features

- Low power, small size, light weight Data Recorder.
- Rugged anodized aluminum enclosure.
- 16 MBytes of memory, with data retention in case of power loss.
- 4 digital inputs: frequency, counters or state.
- 12 external analog inputs.
- 4 internal sensors:
 - 2 internal accelerometers: $\pm 2G$ or $\pm 6G$.
 - Internal Temperature.
 - Supply Voltage
- 1 PWM control/alarm output.
- 1 USB 2.0 full-speed port.
- 2 RS-232 serial ports (COM)
- 2 Vehicle data bus ports
 - CAN1: CAN 2.0a/b (HS-CAN)
 - CAN2: CAN 2.0a/b (HS-CAN)
- Compatibility with:
 - COMGPS – GPS receiver with antenna.
 - COMBLU – Bluetooth radio transceiver.
 - COMMH1 – 900 MHz long range radio transceiver.
 - COMGPR – GPRS (GSM) cellular network radio transceiver.
 - CANOBD – Connect to all OBD compatible vehicle data bus (J1850PWM, J1850VPW, ISO9141-2, ISO 14230 KWP, ISO15765 - CAN)
- Input activated recording – automatic start/stop.
- Sampling rate up to 4kHz per channel.
- All connectors are Vibration Lock™ - Mil spec, no tools required.

Options

OPTMEM-512	Memory upgrade from 16 to 512 MB
OPTRES-14B	Analog input ports B & C resolution upgrade from 10 to 14 bits
OPTACZ	z-axis accelerometer, $\pm 2G$ or $\pm 6G$



Installation

- Attach the Recorder to the vehicle chassis using Dual-Lock™ Velcro, in a dry location.
- Leave enough space next to the connectors for easy manipulation of the Vibration-Lock™ mechanism.
- Position the Recorder such that the three LEDs indicating the system status are visible.
- Align the Recorder's X,Y and Z axis axes along the sensing directions.
- Connect the Recorder to the power supply with the Pro Power Supply Cable (CBLPWS).
- Connect the Recorder to peripherals with the Detector Cable (CBLDTC), Sensor Cables (CBLSEN-A, CBLSEN-B, CBLSEN-C), Communication cable (CBLCOM).
- Protect the Recorder from extreme vibrations.
- Make sure that air flows over the Recorder to avoid high temperatures.
- The Recorder supply ground should connect straight to the power supply. Use 18-AWG for power connection.
- Keep the Recorder and its wires at least 20cm (8") away from high interference electrical devices, such as: ignition coils, plug leads, high-current leads, high emission electronic modules or antennas.

Calibration

This unit is supplied with calibration data for its three internal accelerometers.

Specifications

Description	Symbol	Min	Typ	Max	Unit
Power Supply 11-18V input					
Input Voltage	V_{in}	11.0		18.0	V
Supply Current @ 11.0V ¹	I_{in-11}		58		mA
Supply Current @ 18.0V	I_{in-18}		40		mA
Power Supply 14-39V input ²					
Input Voltage	V_{18V}	14.0		39.0	V
Supply Current @ 14.0V ¹	I_{14V}		55		mA
Supply Current @ 28.0V	I_{28V}		30		mA
Supply Current @ 28.0V	I_{36V}		26		mA
Standard Operating Temperature	T_O	-25		85	C
Extended Operating Temperature ³	T_{O-ext}	-40		85	C
Storage Temperature	T_S	-40		85	C
Internal Accelerometer					
±2G resolution X, Y and Z	ACCRES _{XYZ2G}		0.00488		g/bit
±6G resolution X, Y and Z	ACCRES _{XYZ26}		0.01465		g/bit
0G level	ACCZGL _{XYZ}		2.5		V
non-linearity X, Y	ACCNL _{XY}		±1		%FS
non-linearity Z	ACCNL _Z		±3		%FS
bandwidth X, Y and Z	ACCBW _{XYZ}		10		Hz
Internal Temperature Sensor					
Measurement range	SIG _{TMP}	-40		150	C
Accuracy over measuring range	ACC _{TMP}		±2		C
Resolution	RES _{TMP}		0.48828		C/bit
DTC detector group					
Supply voltage ⁴	V_{DTC}	$V_{in}-0.6$		V_{in}	V
Total supply current ⁵	I_{DTC}			170	mA
Input low voltage ⁶	DTC _{Lo}	-50		2.4	V
Input high voltage ⁷	DTC _{Hi}	2.6		50	V
Internal pull-up resistor	R_{pup}		4.7		kΩ
Input Capacitance	C_{DTC}		100		pF
Input Frequency	F_{DTC}	0.7		1000	Hz
A sensor group					
Supply voltage	V_{SENA}	$V_{in}-0.6$		V_{in}	V
Total supply current	I_{SENA}			170	mA
Input Voltage ⁸	SIG _{SENA}	0		5.0	V
Input Accuracy	ACU _{SENA}		<0.1		%FS
Input Capacitance	C_{SENA}		100		pF
A/D converter resolution	ADR _{SENA}		0.0048828		V/bit
A/D conversion time per chan.	ADT _{SENA}	7		14	us
A/D conv. time all SENB chan.	ADTA _{SENA}	14		28	us
A/D conv. frequency	ADTF _{SENA}	8.928		17.85	kHZ
Sampling speed per input	SAMP _{SENA}	1/600		4000	Samp./sec
B sensor group without OPTRES-14B					
Supply voltage	$V_{SENB-10}$	$V_{in}-0.6$		V_{in}	V
Total supply current	$I_{SENB-10}$			170	mA
Input Voltage ⁹	SIG _{SENB-10}	0		5.0	V
Input Accuracy	ACU _{SENB-10}		<0.1		%FS
Input Capacitance	$C_{SENB-10}$		100		pF
A/D converter resolution	ADR _{SENB-10}		0.0048828		V/bit
A/D conversion time per chan.	ADT _{SENB-10}	7		14	us
A/D conv. time all SENB chan.	ADTA _{SENB-10}	14		28	us
A/D conv. frequency	ADTF _{SENB-10}	8.928		17.85	kHZ
Sampling speed per input	SAMP _{SENB-10}	1/600		4000	Samp./sec

¹ Recorder with no sensor attached

² Recorder regulates the input voltage to 12.0V to supply the sensors, detectors and COM accessories.

³ Extended operating temperature range option is available when the system is ordered

⁴ Voltage supplied by the Recorder to the given sensor or detector group.

⁵ Maximum current before the auto-reset fuse interrupts supply to the given sensor or detector group.

⁶ Single-ended voltage for each detector input.

⁷ Single-ended voltage for each detector input.

⁸ Single-ended voltage for each sensor input

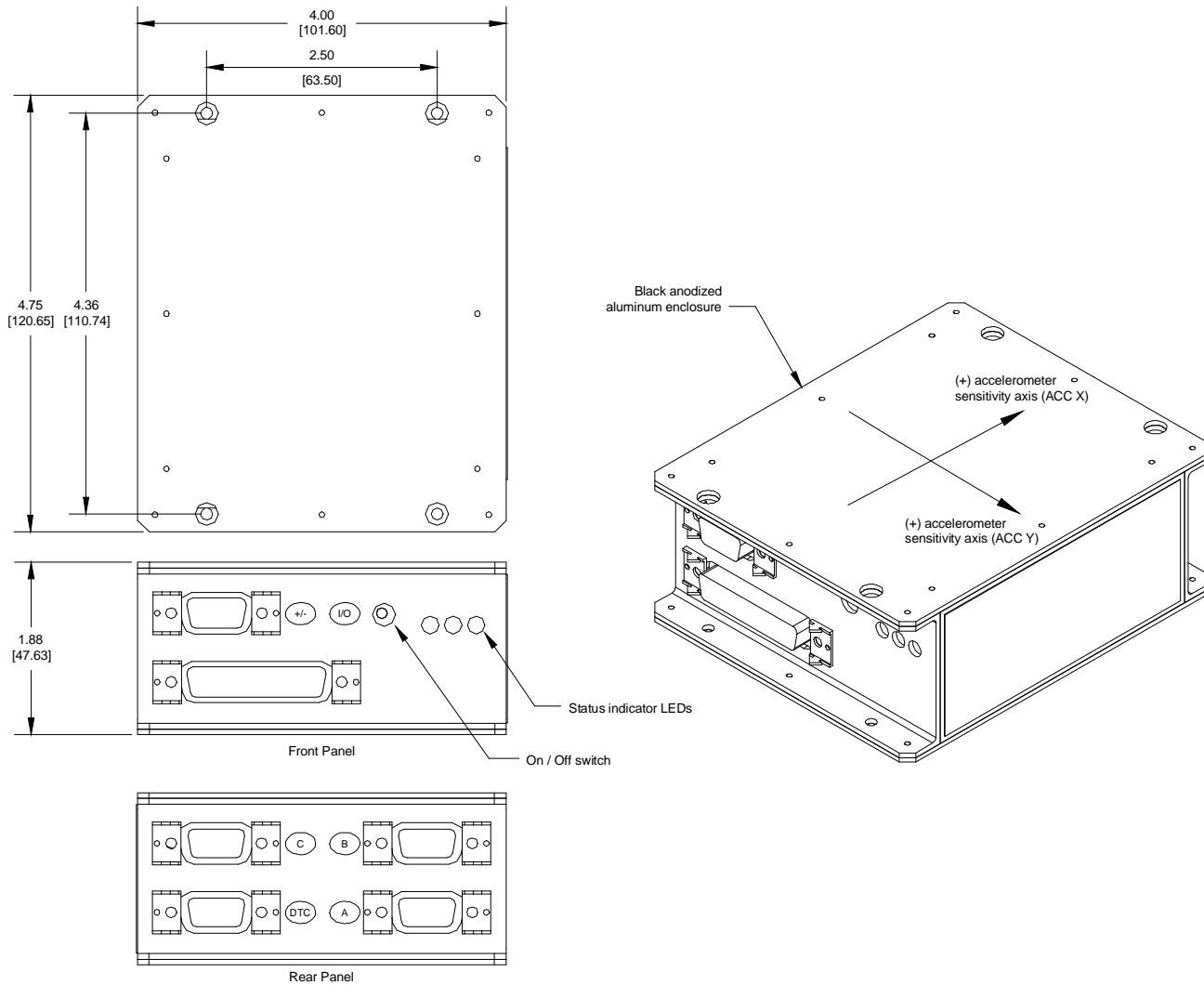
⁹ Single-ended voltage for each sensor input

B sensor group with OPTRES-14B Supply voltage Total supply current Input Voltage ¹⁰ Input Accuracy Input Capacitance A/D converter resolution A/D conversion time per chan. A/D conv. time all SENB chan. A/D conv. frequency Sampling speed per input	$V_{SENB-14}$ $I_{SENB-14}$ $SIG_{SENB-14}$ $ACU_{SENB-14}$ $C_{SENB-14}$ $ADR_{SENB-14}$ $ADT_{SENB-14}$ $ADTA_{SENB-14}$ $ADTF_{SENB-14}$ $SAMP_{SENB-14}$	$V_{in-0.6}$ 0 0 16.666 1/600	<0.01 100 0.000305175 7.5	V_{in} 170 5.0 30 1 2000	V mA V %FS pF V/bit us us kHz Samp./sec
C sensor group without OPTRES-14B Supply voltage Total supply current Input Voltage ¹¹ Input Accuracy Input Capacitance A/D converter resolution A/D conversion time per chan. A/D conv. time all SENB chan. A/D conv. frequency Sampling speed per input	$V_{SENC-10}$ $I_{SENC-10}$ $SIG_{SENC-10}$ $ACU_{SENC-10}$ $C_{SENC-10}$ $ADR_{SENC-10}$ $ADT_{SENC-10}$ $ADTA_{SENC-10}$ $ADTF_{SENC-10}$ $SAMP_{SENC-10}$	$V_{in-0.6}$ 0 7 14 8.928 1/600	<0.1 100 0.0048828	V_{in} 170 5.0 14 28 17.85 4000	V mA V %FS pF V/bit us us kHz Samp./sec
C sensor group with OPTRES-14B Supply voltage Total supply current Input Voltage ¹² Input Accuracy Input Capacitance A/D converter resolution A/D conversion time per chan. A/D conv. time all SENC chan. A/D conv. frequency Sampling speed per input	$V_{SENC-14}$ $I_{SENC-14}$ $SIG_{SENC-14}$ $ACU_{SENC-14}$ $C_{SENC-14}$ $ADR_{SENC-14}$ $ADT_{SENC-14}$ $ADTA_{SENC-14}$ $ADTF_{SENC-14}$ $SAMP_{SENC-14}$	$V_{in-0.6}$ 0 7 14 8.928 1/600	<0.01 100 0.000305175 7.5	V_{in} 170 5.0 30 1 2000	V mA V %FS pF V/bit us us kHz Samp./sec
COM group Supply voltage Total supply Current Regulated Supply Voltage Regulated Supply Current Control output Voltage	V_{COM} I_{COM} $V_{COM-REG}$ $I_{COM-REG}$ V_{CTL}	$V_{in-0.6}$ 4.75 0		V_{in} 500 5.25 500 5	V mA V mA V
CAN HSCAN Interface (Philips TJA-1050) Bit Rate DC voltage at pin CANH/CANL Transient voltage at pin CANH/CANL	BR_{HSCAN} V_{HSCANH}/V_{HSCANL} $V_{tHSCANH}/V_{tHSCANL}$	10 -27 -200		1000 40 200	KBbit/sec V V
Effective download throughput USB COM1, COM2 (RS-232)			330 10		kBytes/sec kBytes/sec
Mechanical Specifications Height Depth Width Weight			48(1.75) 107(4.00) 121(4.75) 508(17.92)		mm(in) mm(in) mm(in) g(oz)

¹⁰ Single-ended voltage for each sensor input

¹¹ Single-ended voltage for each sensor input

¹² Single-ended voltage for each sensor input



All dimensions are in inches [millimeters].