

New

# Introducing The MotionMaster™

Model EDR-6DOF



**Self-contained sensor/recorder  
measures and records 3-axis linear  
acceleration and 3-axis roll, pitch & yaw**

Use IST's New MotionMaster™ to characterize 6DOF motion environments of amusement rides, airborne vehicles, watercraft, underwater vehicles, vehicular crashes, shipping environments and more!

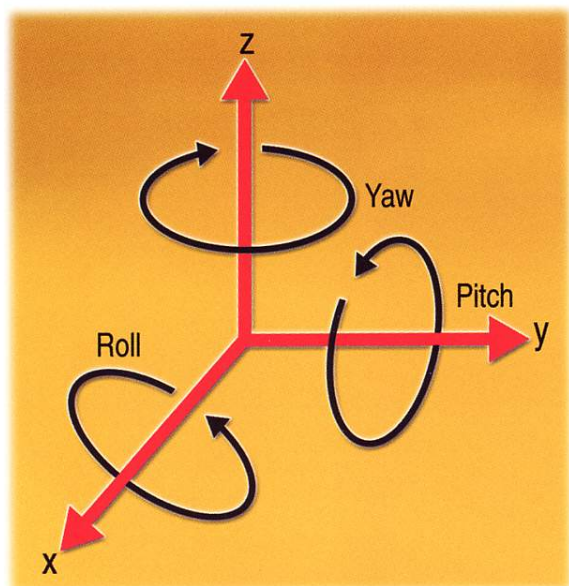


Introducing

# The MotionMaster™

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## Model EDR-6DOF



**Self-contained sensor/recorder measures and records 3-axis linear acceleration and 3-axis roll, pitch & yaw**



The EDR-6DOF is a stand alone, battery operated, 6-axis measurement and recording system that incorporates the power source, digital electronics, analog electronics, and all sensors into a single, robust package. It is capable of measuring and recording six axes of linear acceleration and angular rate data over time periods of up to ten days under battery power. It is capable of withstanding harsh environments where other, less robust systems might not. With 8 MB of installed memory the MotionMaster™ is capable of recording up to nearly ninety minutes of continuous 100 Hz bandwidth data, making it ideal for measuring motion on unattended vehicles during short term tests.

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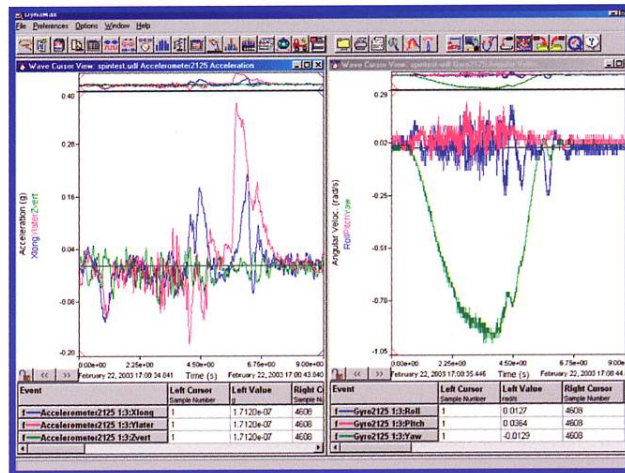
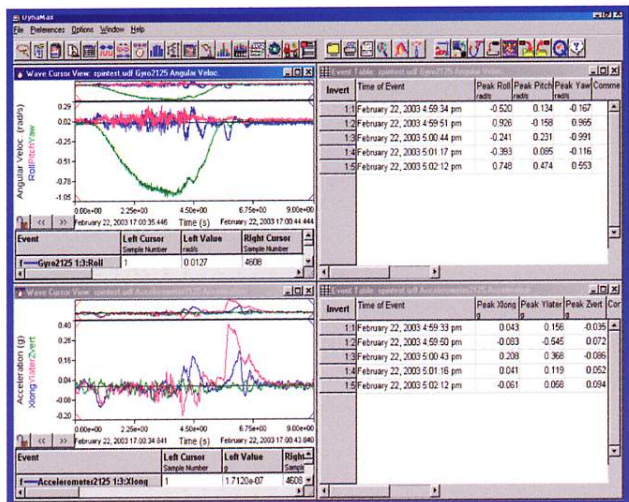
- ✓ 6-channel, 6-axis acceleration sensor/recorder
- ✓ Onboard 3-axis linear accelerometers - x, y, z
- ✓ Onboard 3-axis angular rate sensors - roll, pitch, yaw
- ✓ Eight (8) MB onboard data storage
- ✓ Simultaneous 6-ch digitization to 3200 sps/ch
- ✓ Completely user programmable
- ✓ High speed RS-232 & USB communications interface to PC
- ✓ Completely self-contained, battery powered, rugged
- ✓ Comprehensive user interface software for setup, data download and time & frequency domain analysis
- ✓ Flight qualified, intrinsically safe
- ✓ Patent Pending

### TOTAL EQUIVALENT 6 Channel RECORDING TIME (EDR-6DOF)

	MB	
	Hz	Total Onboard Memory
Analysis Band Width		8
	60	144 min., (*)
	100	87 min.
	500	17 min.
	1,000	8 min.

(\*) Approximate-Max, Assuming Nyquist Digitization Rate





IST's new **MotionMaster™** is fully compatible with IST's popular DynaMax™ - Suite user interface and analysis software package. This analysis environment enables users to analyze linear acceleration and angular rate data within the same graphical environments. Angular rate data can also be integrated, enabling precise angular displacement measurements to be made during different portions of testing. Additionally, angular rate data can be differentiated, enabling analysis of angular acceleration. Frequency domain analysis can also be applied to any of the angular rate data in the same fashion that it can be applied to linear acceleration data, providing powerful 6DOF statistical motion analysis.

## EDR-6DOF Series Recorder Specifications

### DATA ACQUISITION

- #Selectable High Speed CHs
- #Simultaneous High speed CHs
- Digitization
- #Low Speed CHs
- #Simultaneous Low Speed CHs
- Temperature Sensor CHs
- Humidity Sensor CHs
- Battery Voltage CHs
- #Trigger CHs
- High Speed Digitization Rate
- Low Speed
- Digitization, Aggregate MAX, sps

### DATA STORAGE

- MegaByte-Non-volatile SRAM

### DATA MANAGEMENT

- Fill & Stop Memory Mode
- Overwrite Memory Mode
- Sliding Window Overwrite Mode™
- Sliding Window Overwrite with
- Event Type Partitioning
- Sliding Window Overwrite with
- Channel Set Partitioning
- Sliding Window Size
- #Separate Time Windows

### DATA COMMUNICATION

- High Speed Serial RS-232
- USB Compatible, Modem Compatible

### Model EDR-6DOF

- 6 (6)
- 6
- 10-bit
- 8
- 8
- 2 (2)
- (2)
- 2
- (2)
- 185-3200
- 1 sample every 15 sec to 1 sample every 166 hours
- 19200

8

X

X

X

X

X

- Selectable 1 min to 30 days
- Selectable 1 to 100

9.6 to 115kBaud



**SENSORS**

Internal Accelerometer: Piezoresistive Triaxial  
 Internal 3-Axis Angular Rate Sensors  
 Accelerometer fs Range Choices  
 Accelerometer Frequency Responses  
 2g, 5g fs  
 10g, 50g fs  
 100g, 200g fs  
 Signal Filtering: 4th Order Anti-Aliasing, Accelerometer Channels  
 Standard 3dB Cutoff Choices  
 Angular Rate Full Scale Range  
 Options (range/resolution)

Angular Rate Anti-alias Filters/Frequency Response  
 user selectable at time of order  
 Angular Rate Sensor Frequency Response (best case)  
 Automatic Auto-Zero Offset Correction

**PROGRAMMABILITY**

High Speed Sample Rate  
 Trigger Selection  
 Triggering  
 Amplitude Threshold  
 Separate Channel Thresholds  
 Duration (time at level) Threshold  
 Separate Channel Thresholds  
 Trigger Duration Threshold  
 Time Trigger Delay  
 (forced time delay between triggered recordings)  
 Time Triggered Recording  
 Maximum Number of Events  
 Event Length  
 Pre-trigger samples  
 Post-trigger samples  
 Maximum Event Length Cutoff  
 Memory Modes

**OPERATIONAL**

Temperature Recording  
 Range/Resolution  
 Humidity Recording  
 Range/Resolution  
 Usable Temperature Range  
 Digital Clock  
 Date & Time Tagged to Each Acceleration Event  
 Resolution/Accuracy  
 Auto ON and OFF Times

Connectors

Battery Life (Typical) Alkaline C-cell Batteries

Data Memory Backup

**PHYSICAL**

Size  
 Housing  
 Weight  
 Operating Temperature Range  
 Shock Fragility

**STANDARD ANALYSIS**

(with DM95-BASE Software package)  
 Windows 98, 2000, NT, XP compatible

**OPTIONAL ANALYSIS SOFTWARE****HARDWARE OPTIONS**

Relative Humidity Sensor  
 Auxiliary Battery Pack  
 Hand-Held Remote Trigger (HRT-1)  
 Remote Alarm Module (RALM-1)

**Model EDR-6DOF**

x  
 x  
 $\pm 2, \pm 5, \pm 10, \pm 20, \pm 50, \pm 100, \pm 200$

DC-250 Hz, DC-350 Hz  
 DC-400 Hz, DC-1000 Hz  
 DC-1500 Hz, DC-2000 Hz

60, 80, 90, 110, 140, 170, 200, 340, 420, 510, 620, 750, 930, 1120, 1915 Hz

$\pm 150 / 0.30, \pm 300 / 0.60, \pm 1200 / 2.34$  deg per sec

from 40 Hz to 400 Hz  
 DC-400 Hz  
 1% fs / sec

x  
 Internal channels and/or external trigger input

x  
 x  
 x  
 x  
 x

1 to 34463 samples  
 0 to 35000 seconds

1 sample every 15 sec to 1 sample every 166 hours

10582

Fixed or Data Dependent

2 to 16382

1 to 16384

16384 samples

FS, OW, SWO, SWO-ETP, -CSP

Internal & external  
 $-40$  to  $+70^{\circ}\text{C} / \pm 3^{\circ}\text{C}$   
 Internal & external  
 $0$  to  $100\% \text{ RH} / \pm 3\% \text{ RH}$   
 $1$  to  $60^{\circ}\text{C}$

Month / Day / Year, Hour: Min: Sec  
 53 msec /  $\pm 3$  min/Mo

x

DB9 for RS-232 serial or USB adapter  
 (4-pin microdot for external RS-232, USB, aux. power)

10+ days

12+ months

4.2" x 4.4" x 2.5"

Blue Anodized Aluminum, watertight, gasket sealed

2.6 lb.

$-40$  to  $+70^{\circ}\text{C}$

500g or 20 x fs

3-Channel Acceleration and angular rate waveform graphics, histograms, temp/hum process  
 Resultant Acceleration and angular rate waveforms  
 Spreadsheet tabulation of max, min, peak, duration, RMS, crest factor,  
 velocity change, angle, temperature, humidity, dew point, battery volt  
 Data editing and sorting by selected event parameters, statistical summaries  
 Digital filtering-low pass, high pass, bandpass

DM95-int Velocity and Displacement Waveforms

DM95-psd Power Spectral Density (PSD) Calculation and Analysis

DM95-srs Shock Response Spectrum (SRS) Calculation and Analysis

DM95-drop Packaging Drop Height-Equivalent Impact, Zero-G Free Fall,  
 Package Trajectory Animation, Impact Direction & Type.

DM95-deriv Jerk Waveform Calculation and Display

internal and/or external

x

x

x



Instrumented  
 Sensor Technology

Portable Data Recorders For Dynamic Environments

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