AIRCREW HELMET SHOCK ATTENUATOR TEST RIG

IEICOS Aircrew Helmet Shock Attenuator Test Rig

IEICOS Helmet Shock Attenuation Test Rig design for Impact test includes two precision ground shafts of 4m length with linear guide bearings installed vertically to guide the helmet drop assembly of weight 5+0.2–0.0 Kg mass (weight without helmet). A MS frame structure is provided to support the 4m long linear guides.

IEICOS helmet drop assembly is designed to be dropped in substantially frictionless guided free fall onto an anvil mounted onto to a rigid base. A flat steel anvil which has a circular impact face of diameter (130 ± 3)mm and a hemispherical steel anvil has an impact face of radius (50 ± 2)mm are provided.

A headform with its crown vertically facing down is fixed to the drop assembly so that using a ball-joint is provided to mount the helmet for test. The headform can be rotated about the central ball-joint provided in the drops assembly to present the required test areas of the helmet to the rigid anvil. A DEBEL provided triaxial accelerometer is mounted at the centre of gravity of the ball–joint.

A distance measuring transducer with data acquisition system is provided for measuring the height of the drop. This information will be used to calculate terminal velocity of drop. Drop sensing sensors are provided to measure the time taken for the last 40 mm just before impact and hence calculate and display the actual impact velocity.

A winch system with pull cable to lift the drop assembly to the required height is provided. The operation of the winch system is both manual and automatic using computer software. A electromagnet assembly that rides above the helmet drop assembly is provided to hold and drop the helmet drop assembly from the set height.

IEICOS fast data acquisition card for acquiring data from the triaxial accelerometer and other sensors will be used to interface the accelerometer to the computer.

A computer installed with windows operating system, flat panel monitor, keyboard and mouse is provided and configured by IEICOS. A printer is provided to print reports

Software:

IEICOS Helmet Test Rig will be designed as overall control software program for the Helmet Test Rig so that the test rig is complete automated and can be driven and operated from the computer. Software will be for the evaluation and testing helmet and has provision for acquiring signals of transient in nature and of high frequency such as signals from accelerometers. Also signals from proximity sensors and other sensors can be

The software will allow storage, archival, retrieval and computation of various parameters. Software is programmed and customized with graphical user interface displays and other necessary screens for the helmet test rig. Simulation, Hardware Test and Actual Test modes are provided.

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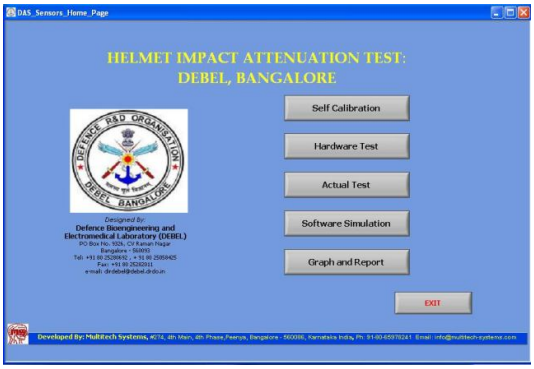
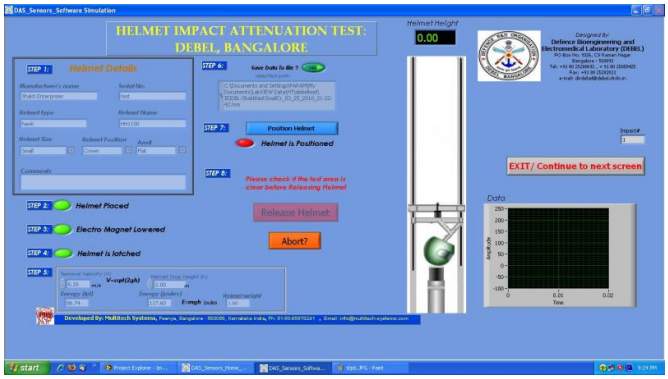
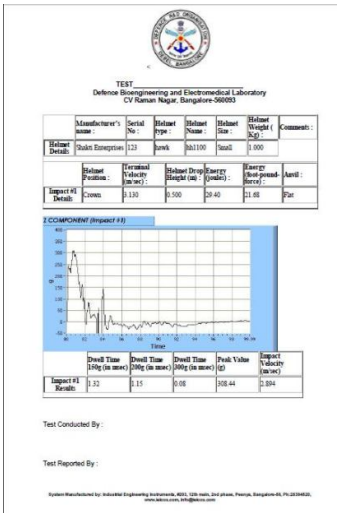
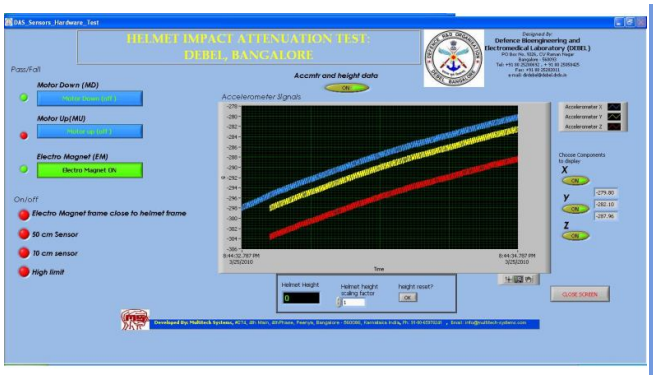
The software is:

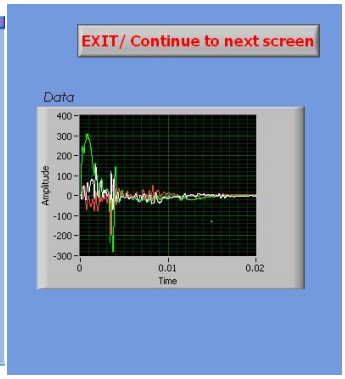
1) capable of 3 axes transient signal acquisition, monitoring, analysis, storage, retrieval and report generation.
2) capable of distance signal acquisition and monitoring from distance sensor.
3) capable of controlling motion of the helmet drop assembly to the set height.
4) capable of integration with data acquisition card and sensor for acquiring transient signal.
5) compatible to run on windows operating system and is designed with labview software.
6) Labview software programmed and customized with graphical user interfaces, displays and other necessary screens.
7) control software is fully automatic so that the whole test can be driven and operated from the computer.
8) able to interface with three axes accelerometer for acquisition of transient signals.
9) able to provide data on online display as well as present data in a printable format
10) The computer system supplied will have the following minimum configuration: Intel Core 2 Duo processor, 320 GB hard drive, RAM 3 GB, suitable cache memory, mouse, keyboard, dvd read/write combo, flat panel monitor.
11) A portable deskjet/inkjet printer supplied for printing reports.











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