MREL BLASTING INSTRUMENTATION

Precise Portable Reliable

TIMETRAP™ DELAY TIME RECORDER

The TimeTrap™ is a versatile portable solution for determining detonator delay timing and discrete (point-to-point) explosives velocity of detonation of short explosives samples.

Description

The TimeTrap™ Delay Time Recorder is a high precision, portable digital chronometric device, used for determining the delay accuracy of electric and non–electric detonators, fuse-heads, impact fuses, detonating relays and trunk-line delay connectors. The TimeTrap™ also measures the discontinuous (point -to-point) velocity of detonation (VOD) of short samples of explosives, detonating cords and shock tube.

Usage

The device is suitable for use in the production and testing of explosives and initiating means in the explosives and military industry and in mining. The electronic unit of the TimeTrap™, is placed in a rugged Pelican case, thus making it suitable for both indoor and field use.

Features

The TimeTrap™ features an extremely high precision timer with microseconds accuracy and input channels that can be triggered by a piezoelectric sensor, photo–sensor, wire burst and optical fibre signals. All the necessary sensors with associated cables and transducers are included. To initiate electric blasting caps (EBCs) and fuse–heads, the device features a built-in generator of a continuous current (firing impulse) that can be adjusted both in terms of duration and intensity. To check the resistance of EBCs and fuse-heads, the device has a built–in ohmmeter that is capable of zeroing the resistance of connecting cables. Although the device works as a standalone system, the output connectors that forward or amplify signals from the sensors and firing impulse generator, allow the system to be connected to an oscilloscope.

The device has four methods used for measurement, the option depending on the object of measurement and combination of sensors used. System setup and display of measurement results is provided over the LCD display. In addition to this, after each measurement is carried out, the results are automatically sent to the built-in serial port. The simple format of the data allows logging to a computer for further statistical analysis and data storage.
It is also possible to directly connect to a printer using a RS232 cable.

High precision measurement of delay times of detonators.

Safety

The TimeTrap™ has numerous built-in safety features to prevent an accidental activation of the EBC. To mention a few: The firing circuit is internally disconnected from the EBC and can get connected only if the fire button is held down for more than one second. Even then, one has to hold the fire button one second further in order to fire. In the case of the method of measurement not requiring the firing ability, the firing function is fully disabled. The ohmmeter circuitry is constructed in such a manner that even in a possible worst case scenario of a malfunction occurring, the maximum ohmmeter measuring current can not exceed 2.0 mA, thus making it absolutely safe for any type of blasting cap.

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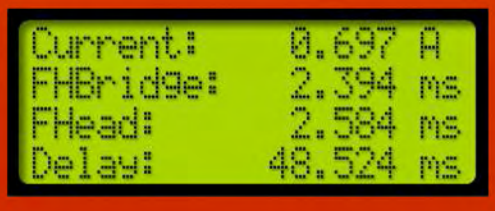
Sensitivity

Adjustable sensitivity of the input for the piezoelectric sensor allows different types of piezoelectric sensors to be connected. This way, the TimeTrap™ can be installed in the existing environments in no time.When using "wire-cut" method for VOD measurements, two led diodes on the electronic unit indicate the continuity of the enameled wire and the contact cabling.

PC Interface

The TimeTrap™ is equipped with a PC interface that enables the storage of data obtained by measuring to be transferred to the computer or printer. This makes testing large batches considerably easier.



EBC

When measuring the characteristics of EBC, Chronos not only provides a total period of delay, but also a current and the moment of burn–out of the fuse-head bridge, time of fuse–head initiation and a total delay time of EBC.

TimeTrap™ Specifications

Power supply: 220 V, 50 Hz
Inputs: piezoelectric sensor (possible adjusting of the sensitivity), photo–sensor, wire–burst (start and stop), optical fibers (with transducers).
Outputs for oscilloscope: Firing impusle signal, Signal from piezo–sensor (amplified), Signal from photo–sensor (forwarded).
Firing impulse: Amperage: 500 mA — 6 A (adjustable). Accuracy: better than 1%.
Duration: 0,5 — 20 ms (adjustable).
Voltage: up to 45 V
Ohmmeter: Measuring range: 0,0 — 19,99 Ω
Measuring accuracy: 0,1 Ω. Functions: zeroing, resetting.
Display: monochromatic, 4 x 20 characters
PC interface: RS232, DB9 female connector

Sensors

The TimeTrap™ includes the following sensors:
- one piezo-electric sensor with magnetic base
- two optical sensors
- two optical fibers (of requested length)
- two signal transducers for the optical fibers
- two enameled wire connectors
- two common, main unit cables

The TimeTrap™ fully complies to the requirements of the following standards: EN 13630-11: Determination of velocity of detonation of detonating cords; EN 13630-12: Determination of burning duration of safety fuses; EN 13631-14: Determination of velocity of detonation; EN 13763-16: Determination of delay accuracy; EN 13763-23: Determination of the shock-wave velocity of shock tube; EN 13736-26: Definitions, methods, and requirements for devices and accessories for reliable and safe function of detonators and relays.

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