

UNIVIB INTERVAL TIMER



For Measuring the Stopping Performance of Machinery



The UNIVIB Interval timer has been designed to measure the elapsed time between two events. When combined with the supplied mechanical “finger” and a draw-string encoder motion detector, the Interval Timer becomes an effective system for the measurement of the stopping performance of moving machinery incorporating light-guard safety systems, such as presses and shears.

An optional measuring wheel encoder motion sensor is also available. This enables the system to be used to measure the stopping times of machinery involving continuous linear or rotary motions, such as conveyor belts and rotating rolls.

A pressure pad start trigger is also available as an option. This allows the system to be used to measure the stopping time of machinery when depression of an E-stop button, rather than the breaking of a light beam, is used to initiate the emergency stop.

The timer itself has been designed with maximum versatility in mind. Timing can be started and stopped by single voltage transitions generated, for example, by plc logic (voltages upto 30V dc can be accepted) or the operation of simple switches or relay contacts (voltage outputs are available to energise such switches). This means that the device can be used in its own right over a wide range of applications to provide an accurate measure of the elapsed time between two “events”, so long as those events can be represented by voltage transitions.

The basic stop performance measuring system is supplied with the following standard components:

Mechanical “finger” - start trigger

This is a spring-loaded “finger” that provides the start trigger for the timing process. The unit is fixed to the machine under test in close proximity to the light guard. The effective diameter of the finger can be changed to suit the beam separation of the guard on the machine under test by means of the interchangeable ends provided (diameters 14, 30 and 40 mm). The “finger” is deployed either by pressing the button on the finger unit itself, or by means of an optional remote release (see below). The mechanical finger incorporates an integral cable for connecting it to the timer unit.

Draw-string encoder motion sensor – stop trigger

This self-contained unit has a magnetic base so that it can be readily fixed to a stationary part of the machine under test. However, for non-magnetic surfaces, the unit can be clamped in position. The unit is supplied with a magnet attached to the end of the draw-string for ease of attachment to a moving part of the machinery. When the machinery is moving, the encoder supplies a pulse train to the timer unit. When the machinery stops the pulse train ceases and this event is detected by the timer, stopping the timing process. The system will cease timing when *either* (a) the speed drops below a threshold of 400 mm/min or (2) the first reversal in the direction of motion takes place.

A cable is included for connecting the encoder to the timer unit.

Communication software for transferring stored measurements to a computer

The Interval Timer automatically stores the results of upto 20 measurements locally. Software is provided for installation on a computer that will allow the readings stored in the memory of the Interval Timer to be transferred to the computer via the built-in serial interface. In addition to simply displaying and printing the measurement results, the software incorporates a facility by which the data can be quickly imported into common spreadsheet and word processing applications. (For computers without a serial interface a serial/USB adaptor will be required).

Power supply and batteries

The timer can be powered either from the supplied mains adaptor or using the supplied re-chargeable batteries (4-off “AA” 1.5 volt). A battery charger is also included. Dry cell batteries can be used if desired.

Calibration report and user guide

Before shipping, each Interval Timer system is checked and calibrated on a purpose-built test and calibration rig. A calibration report is supplied along with a fully detailed user guide.

Description of operation

The unit is powered up by means of the on/off button located on the end panel, which also contains the connectors for the start and stop trigger signals.

The unit is controlled by means of a multi-functional button located on the front panel. This button enables the user to select the following states:

- READY** – the last measurement result (and the one before that, if applicable) are displayed.
- ARMED** – the last measurement result is moved to the top of the window, the active window is cleared and the unit is armed ready for the start trigger. When the trigger is detected, the unit begins timing and the display indicates that the unit is in *timer* mode. When the stop

trigger is detected the unit stops timing, returns to *ready* mode and displays the result in the active window. The result is stored in memory.

CLR – Upto 20 results can be stored in memory. The number of results currently held in memory is indicated by the bar-graph at the bottom of the display. When the memory is full, the *ARMED* state cannot be initiated until the user presses *CLR* to first clear the memory.

The display also indicates the current power source, and if battery, the state of charge of the batteries. Serial number and date of last calibration are also indicated.

In-built versatility – other applications

The UNIVIB Interval Timer has been designed with maximum versatility in mind. The start and stop trigger inputs accept signals upto 30V dc. This means that the timer unit (with no additional accessories) can be used in its own right to measure the elapsed time between two events indicated by changes in plc logic level, such as the instructions to start and stop the motion of a moving machine axis, for example.

Equally the start and/or stop triggers can be provided by the change in state of the contacts of a simple switch. This means that the timer can be used to measure the time elapsing between the closure of relay contacts in the timing of the motion of older, manually controlled machinery, for example. An isolated voltage output is available at each trigger connector to energise switch contacts for this purpose.

Basic system

The basic system described above for measuring the stopping performance of moving machinery includes the following components:

- Interval Timer display unit
- Mechanical finger start trigger with integral connecting cable (2.5 metres)
- Interchangeable finger-ends (diameters 14, 30 and 40 mm)
- Draw-string encoder motion sensor stop trigger with connecting cable (2 metres) and magnet attached to string.
- Mains adaptor (UK or Euro style – to be specified by customer)
- 4-off “AA” NiMH rechargeable batteries (2000 milliamp-hours)
- Battery charger (UK customers only)
- CD with communications software
- User guide
- Calibration and test report

The full technical specification and the price of the system are available on request.

Additional options available

1. Remote release

The mechanical “finger” can be supplied with a remote release facility. The finger is fitted with a lever and a pneumatically operated device similar to that used in the photographic industry is supplied. This then enables the finger to be deployed remotely from a distance of upto 6 metres.



2. Pressure pad switch – start trigger

The pressure pad switch can be used in place of the mechanical finger to provide a start trigger when the depression of an E-stop button (rather than the breaking of a light beam) is used to initiate the emergency stop.



3. Measuring wheel encoder motion sensor – stop trigger

A measuring wheel encoder motion sensor is available to provide the stop trigger for the measurement of the stopping performance of machinery with continuous linear or rotary motions (such as conveyor belts or rotating rolls).



4. Heavy-duty magnetic stand

A heavy-duty magnetic stand for use with the mechanical finger can be supplied. The stand is similar to those used for holding a dial test indicator and allows the finger unit to be quickly and easily positioned, oriented and held firmly in position on the machine, adjacent to the light curtain.



5. Extension cables

3-metre extension cables can be supplied to extend both the start trigger or stop trigger cables.

6. Carry case 1 - accommodates standard kit (+ options 1 and 2 if ordered)

A sturdy, foam-lined polypropylene carry case in which all of the components of the kit (except the magnetic stand) can be conveniently stored and transported.



7. Carry case 2 – (recommended if options 3 and/or 4 are ordered)

A spacious, heavy duty aluminium case with foam inserts is recommended if options 3 and/or 4 are purchased.



The full technical specification and the price of the system and all its options are available on request.

Terms and Conditions

The terms and conditions under which the system is offered for sale are available upon request. The system is specifically not for sale or use in the USA or Canada.