

## LARGE AREA OPTICAL TARGET TYPE 340



The Optical Target Type 340 provides a virtual target plane for detection of a wide range of projectiles. Designed primarily for indoor use, it can detect projectiles with calibres between 4mm and 150mm travelling at velocities between 10m/s and 2500m/s. It will measure the X-Y coordinate position of shots at rates of fire up to 10,000 rounds per minute with an accuracy of  $\pm 2.5$ mm. The standard active target area on a self-standing frame is 1m x 1m, although the design allows for target areas of 5m x 5m and higher.

### OPERATION

Projectiles passing through the target plane are detected and their X-Y positions calculated. The position data is then transmitted to a remote computer where it can be displayed, stored and printed.

Detection of the projectile is performed by two optical sensing arrays, one for each axis. The array is known as a 'camera' and consists of a linear row of closely spaced photodetectors.

Each camera is aligned with a linear light source, which is on the opposite side of the target plane. The sensing area of each detector is restricted to an accurately defined fan. The fans overlap so that a projectile will be detected by a number of adjacent sensors. The detection pattern is used to calculate the position of the projectile.

The circuit associated with each sensor is designed to detect only fast moving objects (rapid changes in light level) so that slow variations in the light level e.g. voltage variations or insect movement, will have no effect on the operation of the target.

The two cameras are connected to a Control Unit. This unit contains the power supply for the system and the processing circuitry required to convert the camera signals into X-Y co-ordinates, which can then be transmitted to the remote computer.

The Control Unit continually scans each camera to check if any sensors have been triggered. When a valid trigger pattern is found, the data is processed to generate the X-Y position, which is then stored until requested by the remote computer.

Connection to the computer is via a serial link, which may be an RS232, RS485 or MS Instruments PLC serial interface (compatible with other targets and the MS Instruments PLC Line Receiver Interface).

### THE HARDWARE

The Optical Target comprises three basic units: The camera, the light source and the control unit.

**The camera** consists of a linear metal housing of a length a few cms more than the detection area; the width and height is approximately 320mm and 250mm. The camera contains a number of detector modules, which are located side by side and form a continuous line of photodetectors. The line of detectors is set up to view a linear light source, which is located on the opposite side of the target plane.

A separate connector provides power to the camera from the Control Unit.

**The light source** is provided by a solid-state light source comprising a number of Light Emitting Diodes.

**The control unit** has the X and Y cameras connected to it by two pairs of cables; one cable supplies the power to the camera and the other is a 26-way cable, which provides the link for the digital signals controlling each camera. The control unit is an intelligent device that allows configuration of various target parameters e.g. lockout time and shot calculation algorithm.

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### SYSTEM CONFIGURATION

#### THE RANGE CONTROLLER

The Optical Target is connected to a remote computer known as the Range Controller. This IBM PC<sup>®</sup> compatible unit runs the system software through which the target is controlled. Set-up parameters may be configured and a wide range of diagnostic testing performed. The software also displays the shots on screen during firing and may provide printouts and store data to disk; in addition, a series of data analyses may be performed on all shot data. The Range Controller can also be used to interface to MS Instruments PLC Velocity and Rate of Fire measurement systems as well as pressure measurement systems.

#### INSTALLATION

The cameras and linear light sources are mounted either on a framework or to the walls, floor and ceiling in the case of larger units. The system software provides a range of set-up utilities to ensure that a quick and simple installation can be achieved.

### SPECIFICATION

Active Target Areas	From 1m x 1m to 5m x 5m as standard	Rate of Fire	Up to 10,000 rounds per minute
Measurement accuracy	± 2.5mm	Operating temperature	0° C to 50° C
Projectile Velocity Range	10 m/s to 2000 m/s	Humidity	95% non-condensing
Projectile Calibre Range	3.5mm to 150mm	Power Requirements	230v ± 10% 50/60 Hz, 200 VA per m (5m x 5m approx 2000VA).
		Dimensions	Depends on target size