

## OPTICAL DETECTOR TYPE 858



The Type 858 Optical detector is used to generate an output pulse when a projectile passes immediately overhead. It can be used in conjunction with other units such as the 817 to provide a Projectile Velocity Measuring System. Such a system can, to within an accuracy of up to 0.01%, record velocities from as low as 10 metres per second to in excess of 5000 metres per second. Under normal conditions, the projectile would be detected at a height of up to 500 times the projectile calibre.

The 858 is based on the previous 758 unit, but has been completely re-designed. The new unit is now much more sensitive with blue light illumination and is usable in nearly all outdoor lighting conditions. This rugged and sophisticated system will operate where background illumination conditions are as low as 50 foot- lamberts thereby enabling it to be used successfully on both naturally lit outdoor ranges, as well as artificially illuminated tunnel ranges. Solid-State DC light sources Type 788 are available for tunnel work.

### Timing Unit (Chronograph)

The complete system requires a Timing Unit type 817 and Windows software to provide a sophisticated Velocity Measurement system. The unit can also be used to measure rate of Fire for automatic weapons. The units may also be connected to the Ballistic Data Acquisition System (BDAS). The BDAS provides measurement of gun barrel pressure as well as velocity and rate-of-fire. Both units provide remote gain control, light level and trigger monitoring of the 858.

The Optical Detectors are mounted on light alloy plinths from which they can be easily removed. This feature allows the plinths to be permanently installed on a range if required. The Detectors may also be mounted on the tunnel wall which allows untidy floor cable runs and obstructions to be avoided. For Forensic and other applications where the extent of baselength variation is critical, fixed-spacing cradles can be supplied with a UKAS-certified calibration piece.

A BNC Connector mounted on the base of the Optical detector provides a TTL output pulse which may be used to trigger other equipment such as a high-speed camera. Another connector provides a measurement of the DC voltage level allowing the DC Light to be easily aligned with the Detector.

As a projectile passes through the field of view of the Start and Stop Optical detectors, a small change in illumination is detected. This change is translated into an output pulse. The gain is remotely settable for a range of calibres.

Incorporated within each Optical detector is an automatic gain control system, which compensates for ambient light changes.

A tracer shield can easily be fitted to the Optical detectors to enable velocity measurement on tracer rounds to be made.

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### SPECIFICATION

#### OPTICAL DETECTOR

##### General Specification

Lens	50mm Focal Length Camera lens working at full aperture
Field of View	$36^{\circ} \pm 2^{\circ} \times 0.17^{\circ} \pm 0.01^{\circ}$ for 50mm lens
Projected Slit Width at 1m	1.5mm for 50mm lens.
Operating Brightness Range	15 to greater than $1500 \text{ cf/m}^2$ (from 50 to greater than 5000 foot lamberts) at a source colour temperature of $2780^{\circ}\text{K}$ .
Slit Position	Defined by two bosses brought out on plinth.
Vertical Alignment	$0.3\text{mRad}$ .
Pre-set Elevation Angle	0, 15, 30 and 45 degrees.
Sensitivity	The Optical Detectors will respond to less than 0.1% change in ambient light level.
Projectile calibre	2mm to 155mm and above.
Projectile Velocity	10 m/s to greater than 5000 m/s.
Monitor Outputs	The level of illumination may be monitored in terms of the DC voltage at the BNC socket mounted on the base of the Detector. This level may also be remotely monitored.
Pulse Output	Fed by line driver to the 817, BDAS or other unit.
Power Supplies	Furnished by the Remote Unit and fed by way of a multicore cable.
<b>Environment:</b>	
Operating temperature Range	$-25^{\circ}\text{C}$ to $+60^{\circ}\text{C}$
Humidity	Units are sealed against moisture
<b>Dimensions:</b>	
Size	324mm x 280mm x 365mm
Weight	14Kg each

A full calibration service traceable to national Standards is available.