

PREEMPTOR

LASTEC has developed a laser based hand held stand-off explosive identifier named as 'PREEMPTOR' to identify explosives. PREEMPTOR is a complete explosive identification system with hardware and software for in-situ screening of all kinds of explosives in form of liquid, solid and powder contained in transparent/ semitransparent containers from a stand-off distance of 30cm extendable upto 5 meters. The system is based on Raman backscattering technique, which provides fingerprint of explosive materials in terms of Raman shifted light signals. PREEMPTOR illuminates the targeted materials with laser and records the Raman scattering signals. An indigenously developed spectral analysis software processes the Raman signals with the help of an in-built single-board computer. The algorithm provides automatic acquisition of data, its processing and finally matching of Raman peaks of different explosive materials which are stored in computer library to provide information about targeted materials in text as well as audio alarm simultaneously in about 10-12 seconds. The system has been evaluated rigorously for variety of explosive samples including military grade samples, IED type samples and mixtures of two or more explosive samples. The library can be easily upgraded for other chemical agents and their mixtures.

The system has potential for both military and civilian applications. This system can be used on suspected targets at entry points of important installations like airport, metro station, railway stations, VIP venues etc in screening of liquids in translucent bottles or materials in plastic bags. During search operations by security forces, this system can be used for confirmation of materials recovered from individuals or vehicles.

Various security agencies have shown keen interest in this system and the system has undergone user evaluation with paramilitary forces and Indian Army.

Although commercial Explosive identification systems are now available for screening of explosives and chemicals but following salient features of PREEMPTOR system makes it unique

- Non-contact detection with stand-off range from 30cm to 5m
- In-situ method and no sample preparation required
- Online identification and declaration of explosives/ Explosive derivatives/ Mixtures of explosives in less than 12sec
- Easily expandable library (presently 45 explosives and 5 mixtures tested)
- No warm up time & no interval between two measurements
- Screening of more than 100 explosives in 1hour
- Minimum maintenance
- Low false alarm rate



Photo of PREEMPTOR