

Product Feature Summary

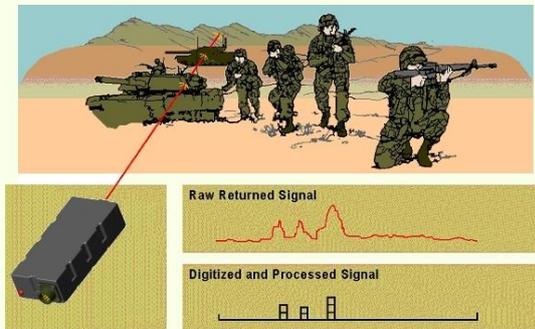
RangePRO Laser Rangefinder Modules



“Advanced digital ranging technology: precise, compact, robust.”

Digital Ranging Technology

Laserdyne's unique ranging techniques extract more useful data from a single ranging pulse than any other method on the market today.

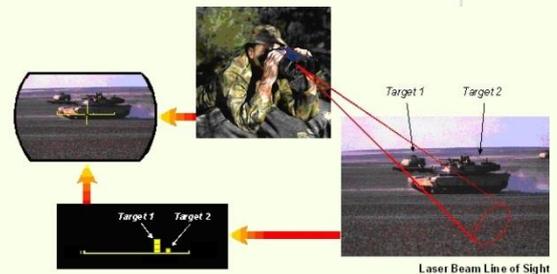


These systems employ advanced digital signal processing technology to provide accurate, reliable ranging with true multiple-target detection capability. This key technology was developed by Laserdyne for ranging and mapping applications.

Signals from the detector are recorded for the entire round-trip time of the laser pulse corresponding to the maximum rated ranging performance of the product (e.g. for a model rated to 10km, a round-trip time of 20km). These signals are digitised, stored and "combed" with a filter to determine potential real target returns which are then processed to accurately determine their ranges.

Multiple Target Detection

Laserdyne's unique ranging techniques offer true multiple targeting solutions - making range gating an option but NOT a necessity. Real-time processing of the returned waveform provides range data for any selected target.



In some cases (e.g. ranging through vegetation, or targets in a convoy) there may be a reflection from more than one object in the path of the laser. Less advanced rangefinders have limited facilities for selecting the first or last target or the largest target but they do not provide the capability to store and post-process all returns. The user therefore has to fire the rangefinder again to try to get a return only from the target of interest. This takes additional time, unnecessarily.

Only the RangePRO family of laser rangefinders have the capacity to determine and report all returns and provide the user with a simple means of determining the range to all returns along the line of sight after a single firing of the laser. The user can easily interrogate the system for detailed data on each target, if required.

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RangePRO Laser Rangefinder Modules

Ranging Performance

The RangePRO family of rangefinders identify and extract real returns even under conditions that result in low Signal-to-Noise Ratios.

When employing eye-safe levels of output energy, the challenge to detect targets becomes even greater - the RangePRO approach uses optimised signal processing algorithms to extract low signals from background noise, without the need for expensive APD type detectors.

Ranging performance, however, is a function of many more factors than the laser output. It is also a function of the target intercept area (i.e. how much of the laser beam is intercepted by the target), target reflectivity, angle of the target to the beam, and the prevailing atmospheric conditions.

Target reflectivity refers specifically to diffuse reflectivity and is often referred to as albedo on a scale of 0 to 1. To be most meaningful it should be expressed at the wavelength of the laser transmitter - in the case of RangePRO model, this is at 1,570nm. Most ranging requirements and specifications are qualified for Standard Clear conditions and may go into more detail relating to airborne particulate matter, gas concentrations and vapour. Atmospheric conditions are summarised in the table below:

Atmospheric Condition	Sea-level Visibility (km)
Exceptionally Clear	60
Standard Clear	23.5
Light Haze	8
Heavy Haze	3

Atmospheric Conditions

Ranging Performance (cont'd)

Some typical target areas are shown in the table below. Note that the target needs to be interpreted as to the actual intercept area.

Target	Typical Target Area (m ²)
Man-size	1
Small vehicle (e.g. jeep)	5.3 (2.3 x 2.3)
Large vehicle (e.g. tank)	12
Small building	20
Large Building	60

Typical Target Sizes

High Reliability Laser Modules

The RangePRO family employ compact, reliable laser modules. The subsystem in any laser rangefinder which dictates the ultimate system reliability is the laser itself. RangePRO rangefinders use one 2 types:

- a miniature, ultra-reliable, flashlamp pumped type for single shot to 1Hz operation; and
- a diode-laser pumped type for repeat-pulse applications.

Single shot miniature type:

These laser modules are used in single shot and low rep. rate (to 1Hz) models. They are Nd:YAG/OPO systems developed by Laserdyne and proven over years of use. They are noted for their compact structure, and their reliability over a wide temperature range. These lasers have been tested for operation from -32 to +60 degrees C.

Repeat-pulse type:

These diode-laser pumped modules are used in repetitive ranging models and are a relatively new development, having been refined for military use by Laserdyne in recent years. This has resulted in compact laser modules that represent the state-of-the-art in diode-laser pumped eye-safe laser technology. Like the single-shot type, they also utilise a Nd:YAG/OPO cavity configuration and exhibit excellent stability over a wide temperature range. They can be operated from single shot to 30Hz..



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