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Thermal Imaging and Distances: Detection, Recognition and Identification

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When people shop around for a thermal imaging device, one of the most frequent questions they ask is “how far can I see with it?” It may sound strange, but this question is extremely complex and many-sided. To get a precise answer one needs to take into account a variety of factors that could be separated into two groups: *inner* and *outer*.

Before we identify these factors, let us first define the terms “Detection”, “Recognition” and “Identification”. These definitions are based on work by Johnson who introduced a criteria to assess performance of optical equipment back in 1950s.

Detection: you can distinguish an unknown object from the background

Recognition: you can tell what kind of object this is (e.g. human, car, etc.)

Identification: you can describe the object in details (e.g. a male civilian or a four-door sedan).

The example on the right illustrates the idea of detection, recognition and identification of a Canadian goose.

Inner factors that determine the range are related to the characteristics of the thermal system you are using. These parameters are: detector sensitivity, lens focal length, lens f-number, thermal detector’s resolution, display resolution and type

Outer factors involve object size, environmental and weather conditions, the difference between the object and the background.

It now becomes quite obvious that one cannot give a definitive answer to that “how far?” question. Some manufacturers bluntly state detection, recognition and identification figures, or DRI for short, without even mentioning what these performance figures depend on.

For those folks who wish to accurately measure distances, there exists a unique feature called Stadiametric Rangefinder (SRF). This upgrade to a thermal imager enables quick range estimation and has no lasers, so there is no way you will be detected by someone else! To find out more about the SRF, [please follow this link](#).

Special points of interest:

- “How far can I see?..”
- Detection, Recognition and Identification
- Dare to Compare Leading Brands’ Quality to GSCI’s?



Detection, recognition and identification

Dare to Compare?

In this issue of "Dare to Compare" we revealed that DRI distances may significantly vary even if you are using the same device. Ask your manufacturer to provide as many details as possible to make sure that the device you are interested in meets your requirements.

We always encourage everyone to compare quality and characteristics of GSCI night vision and thermal imaging systems to those from the next leading brands.



Links to previous GSCI newsletters:

1. [F-number Explained](#)
2. [Image Quality in Thermal Imaging: Resolution](#)
3. [Image Quality in Thermal Imaging: Sensitivity](#)
4. [Image Quality in Thermal Imaging: Refresh Rate](#)
5. [Deciphering Figure of Merit \(FOM\) in Night Vision](#)
6. [Thermal Image: Black-and-White or Colour?](#)
7. [Manual Gain Control in Night Vision Devices.](#)

References:

1. http://en.wikipedia.org/wiki/Johnson%27s_criteria



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