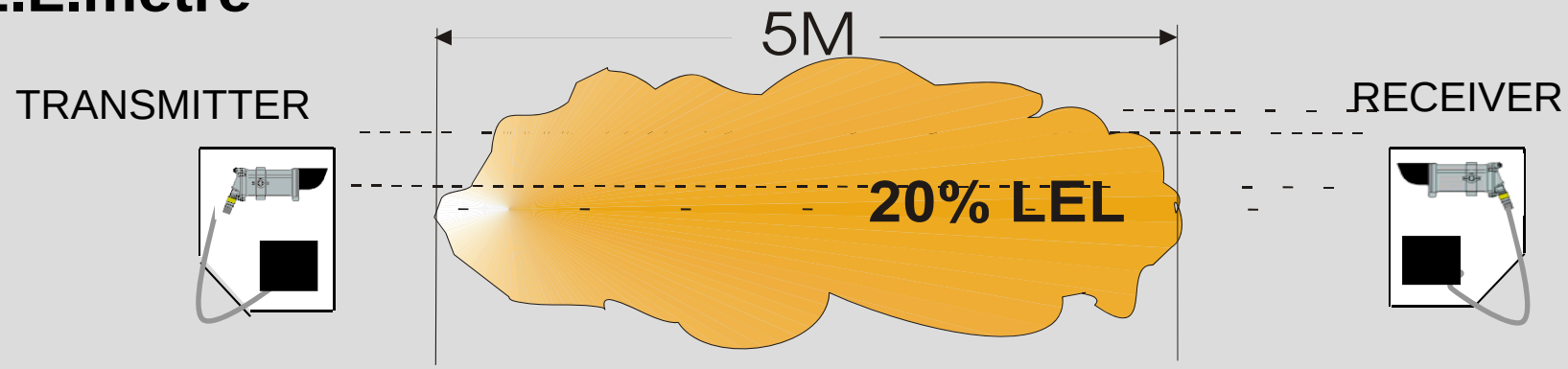
Open Path Gas Detection

How the LELm Reading is Calculated

L.E.L.metre

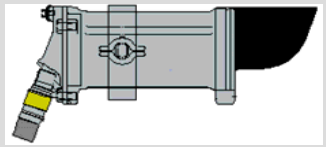


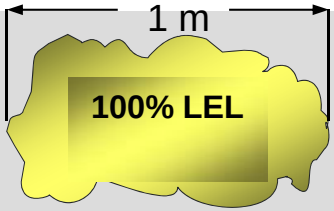
The OPGD's measure the total quantity of hydrocarbons in the beam.

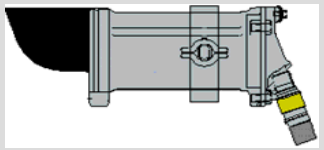
- The Measurement is expressed as the length of the gas cloud in the beam (metres) multiplied by the gas concentration in the traditional units of Lower Explosive Limit (LEL) producing a measuring scale in LEL.metres.
- In the example above, the length of the cloud is 5 metres; the average concentration of gas within it is 20% avgLEL. Therefore 5m x 20%LEL = 100%LELm = 1 LEL.metre

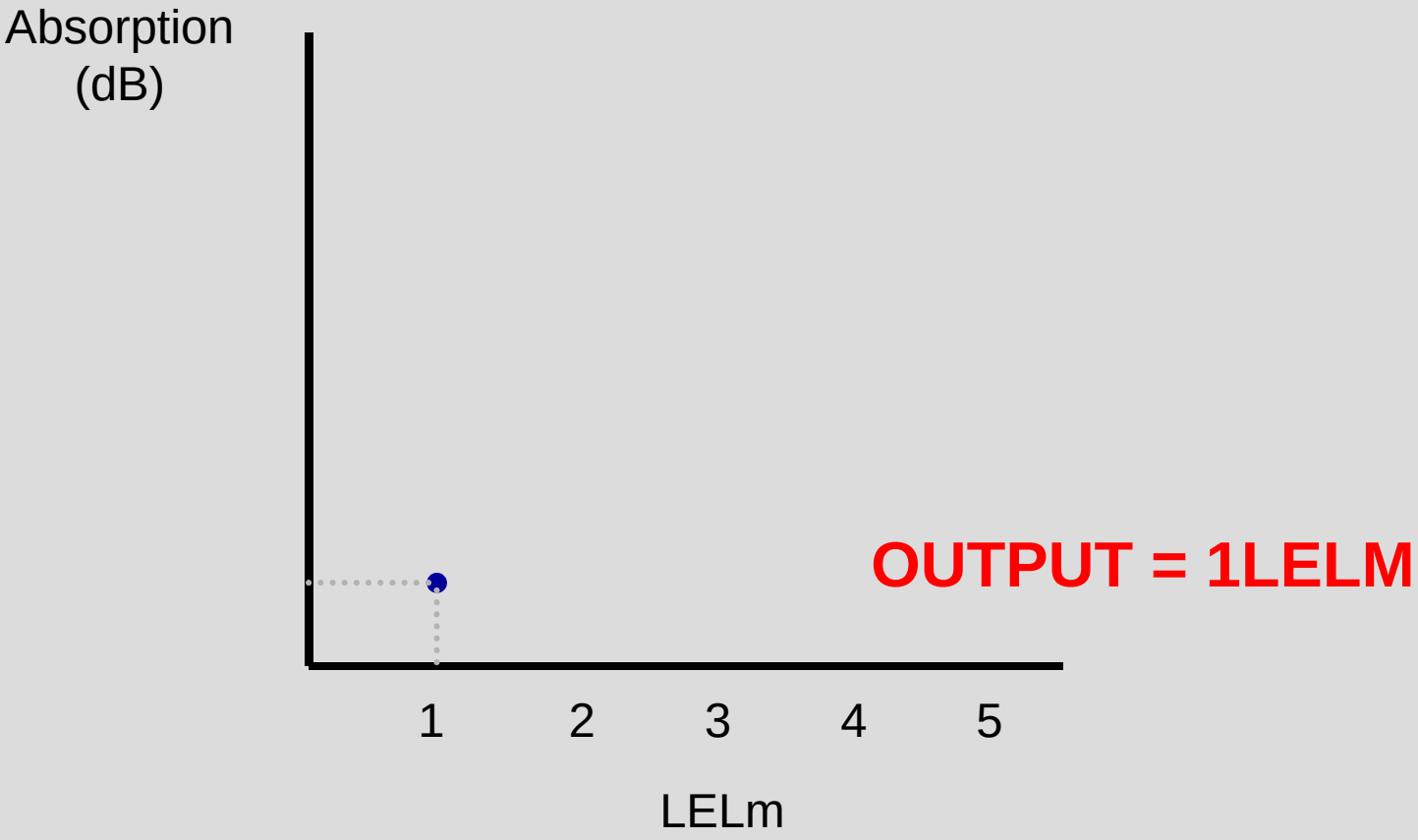
Open Path Gas Detection

How the LELm Reading is Calculated





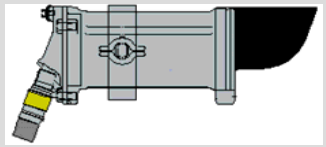


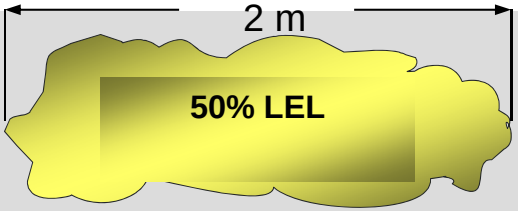


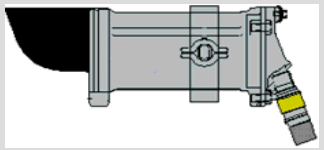
OUTPUT = 1LELM

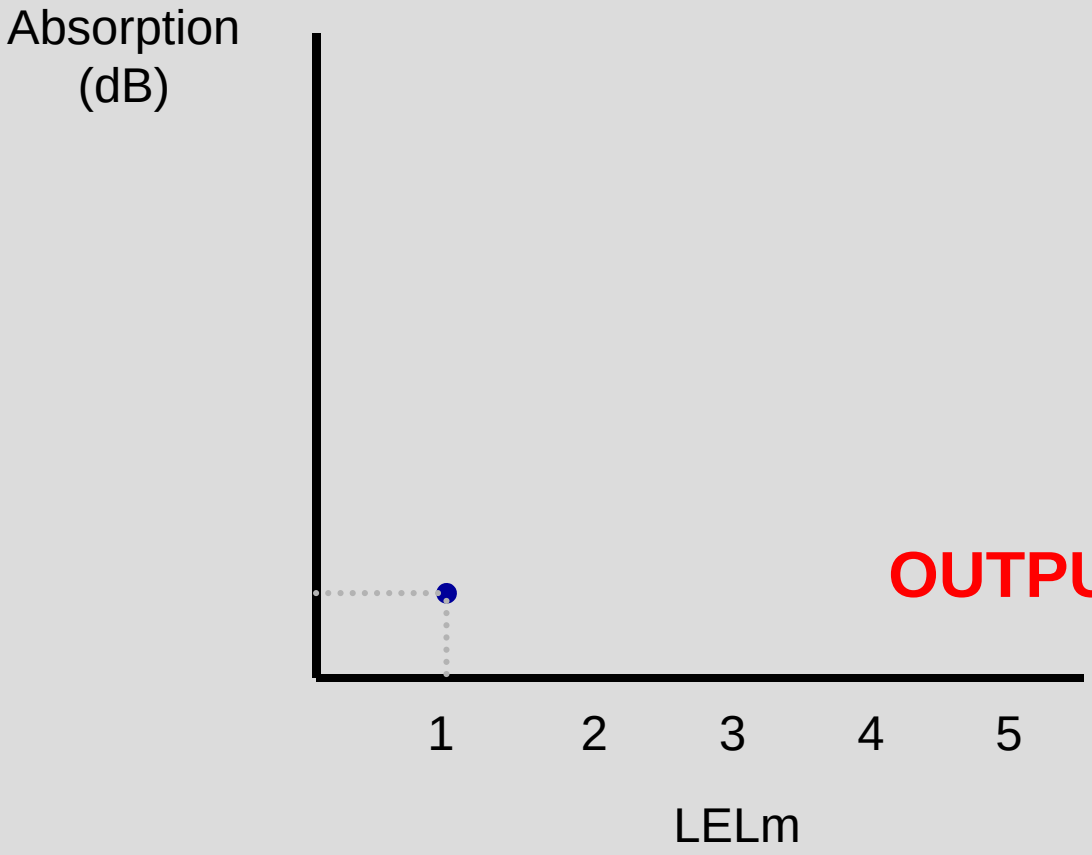
Open Path Gas Detection

How the LELm Reading is Calculated









OUTPUT = 1LELM

Open Path Gas Detection
How the LELm Reading is Calculated

- Does the open path detector know the concentration of gas and size of cloud in its beam path?
  - No
- So how can it give a reading based on the two units of LEL and metres?
  - During factory calibration a number of gas cells of a **known** size, filled with a **known** concentration of gas are introduced into the beam path of each detector. The different levels of IR absorption are then recorded into the memory of each Receiver.

Open Path Gas Detection
LELm Output

- When the Receiver unit detects absorption of the IR signal wavelength. A check of its memory verifies the level of gas present and the unit outputs a reading in mA to a control system.
- A Hydrocarbon gas is built up of CH molecules, the more gas present the more molecules present. This could be in the form of a large concentration over a small area or large volumetric amount with low concentration.

The open path gas detector does not differentiate between a small cloud of high concentration, or a large cloud of low concentration.