



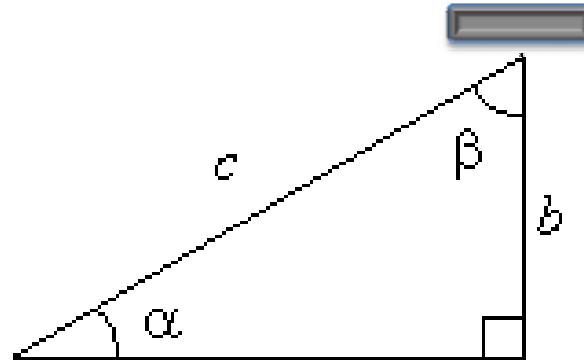
Roger-GPS Ltd

GPS Repeaters and solutions Coverage calculations



16.11.2011

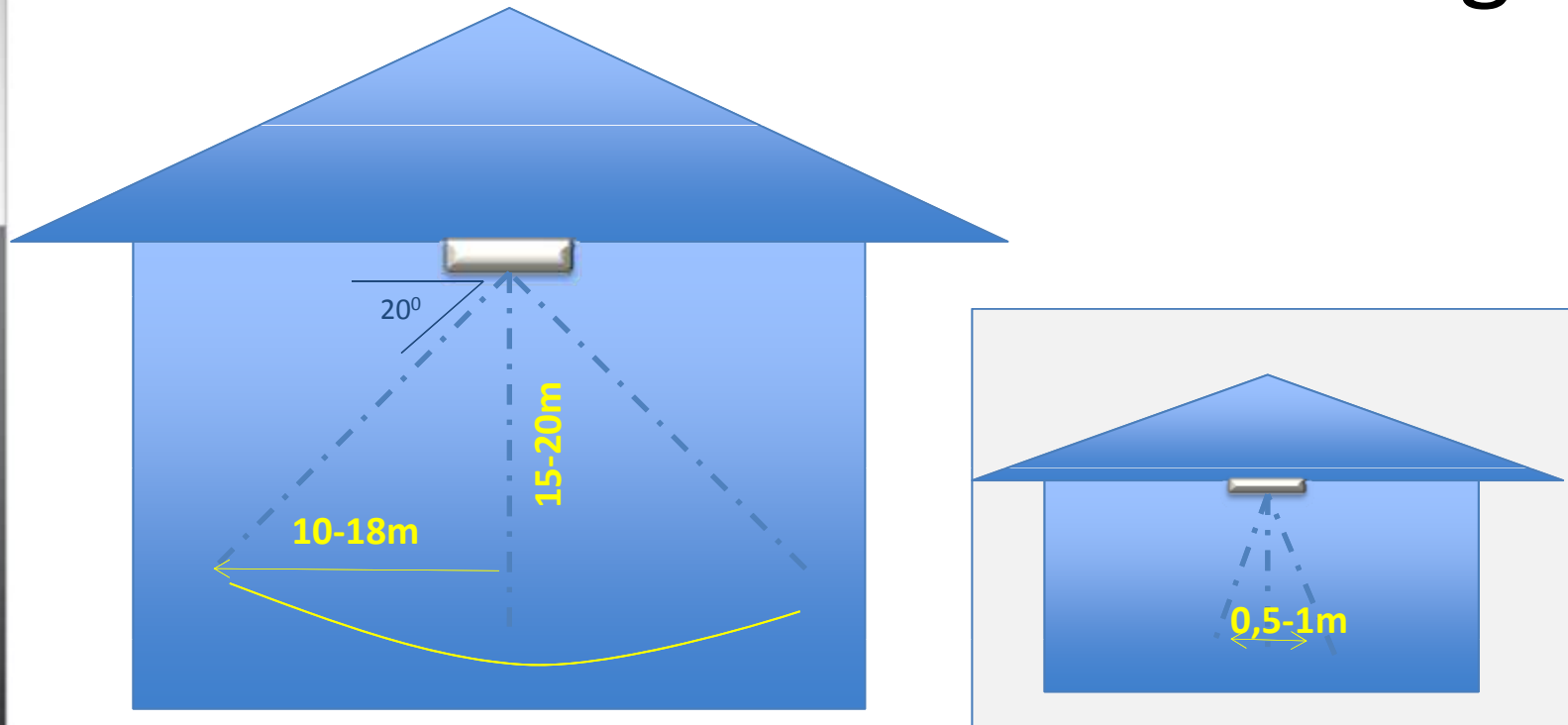
How to calculate the coverage?



$$\tan(\alpha) = \frac{b}{a}, \quad \tan(\beta) = \frac{a}{b}$$

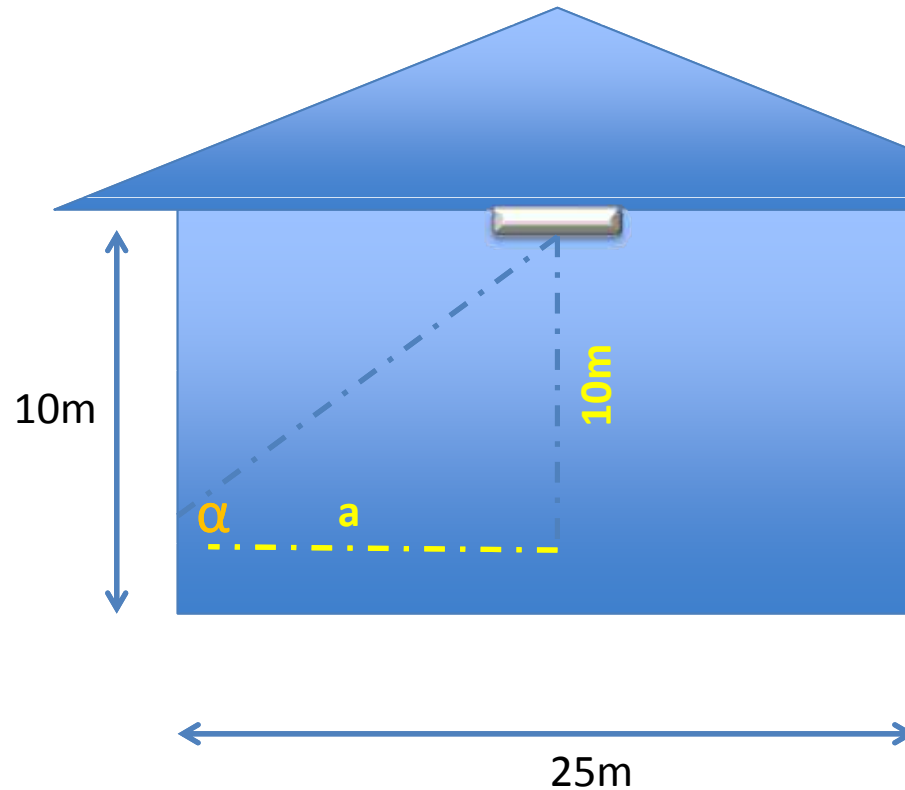
- Angle β is about 70° in the Roger-GPS repeater:
 - c is max 15-20m, depending on the GPS receiver sensitivity and the surface and obstacles on the wall
 - b is max 15-25m depending on the GPS receiver sensitivity and the surface and obstacles

Rules of thumb in coverage



- How big is the area one Roger-GPS repeater covers:
 - The diameter as about 30m depending on the construction material
 - The height is up to 15-20m depending on the construction material
 - The material (cars, other big metal particles) create reflecting waves that may influence the area coverage
 - The repeater has 40dB gain adjustment so you can go from 30m down to less than 1 m diameter

Example case, hall 10m high, 25x50m²



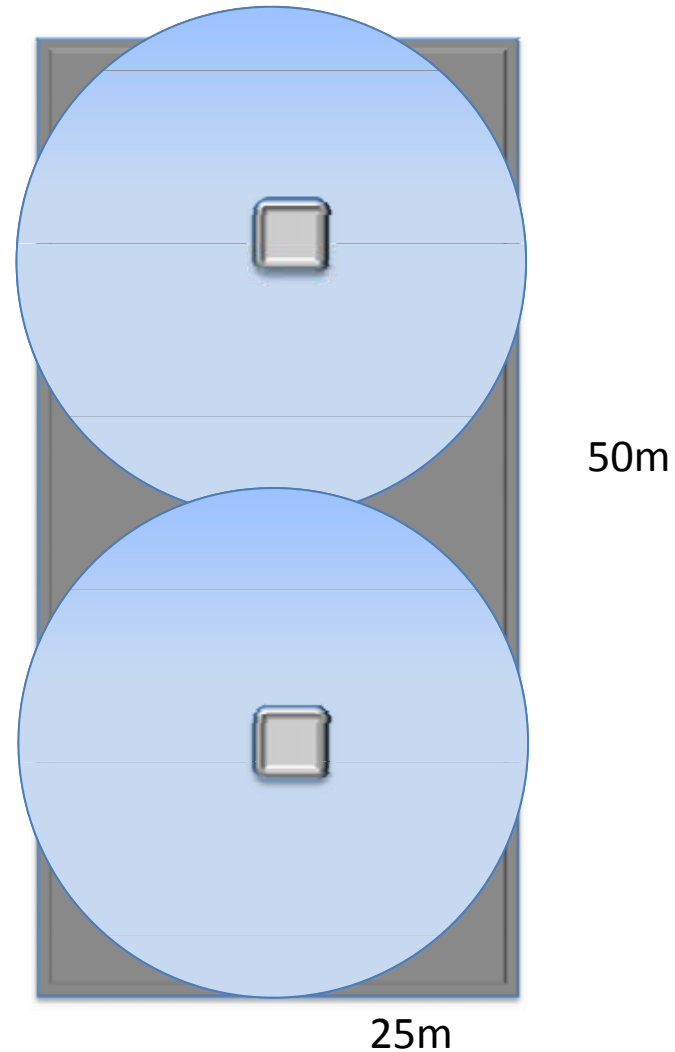
The formula
 $\tan(\alpha) = b/a$

In your case:
 $\tan(20) = 10/a$
 $a = 10/\tan(20)$
 $a = 10/0,36397$

$a = 27,5\text{m (max)}$

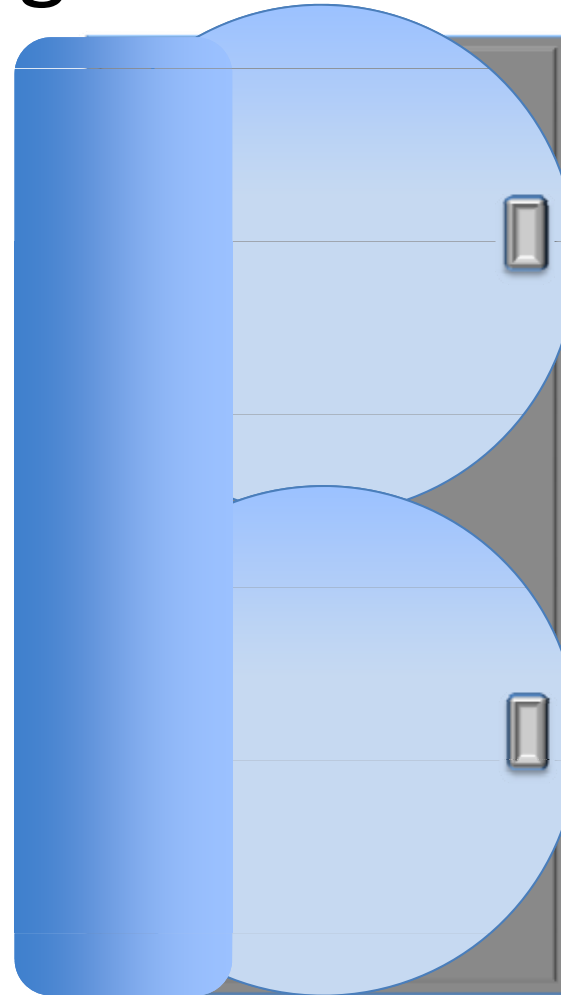
Configuration proposal

- Assuming 2 repeaters are enough
- Size of the building is 25x50m²
-



Configuration – the repeaters hanging on the side wall

- Assuming 2 repeaters are enough
- Area where you might have problems?

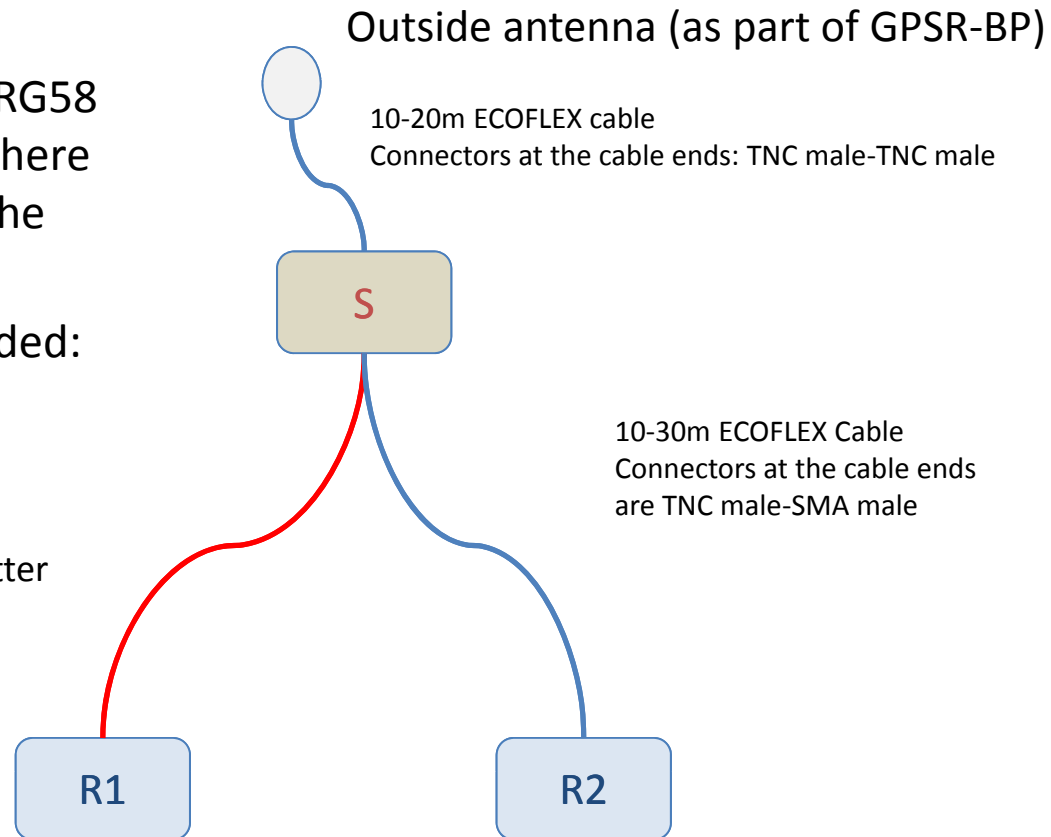


50m

25m

Configuration proposal

- 1 piece 19,5m long RG58 cable (coloured red here under) included in the GPSR-BP
- Other products needed:
 - GPSR-S
 - GPSR-1
 - Cables
 - Terminators for Splitter



Both 2repeaters are repeating the same one position that the outside antenna delivers.

ROGER GPS splitter (GPSR-S)

ROGER GPS Signal Splitter is used to distribute GPS signal to several GPS Repeaters. Splitter works with both GPS L1 and L2 frequency bands. It has one chaining output and four repeater outputs. DC power is passed from the chaining output to the input connector for GPS line amplifier and GPS receiving antenna. If the signal is to be transmitted to fewer than five repeaters, the unused ports should be terminated.



TECHNICAL SPECIFICATIONS

Size	110*143*28mm
Weight	185 g
Operating temperature	35 +85°C
Connectors	TNC female input, 5 x TNC female output: 1 x -1dB with DC pass 4 x -12dB
Frequency range:	1200-1700MHZ
Impedance:	50Ω
Power	The splitter is powered through the output / DC input connector by the ROGER GPS Repeater