RADAR APPLICATION NOTE

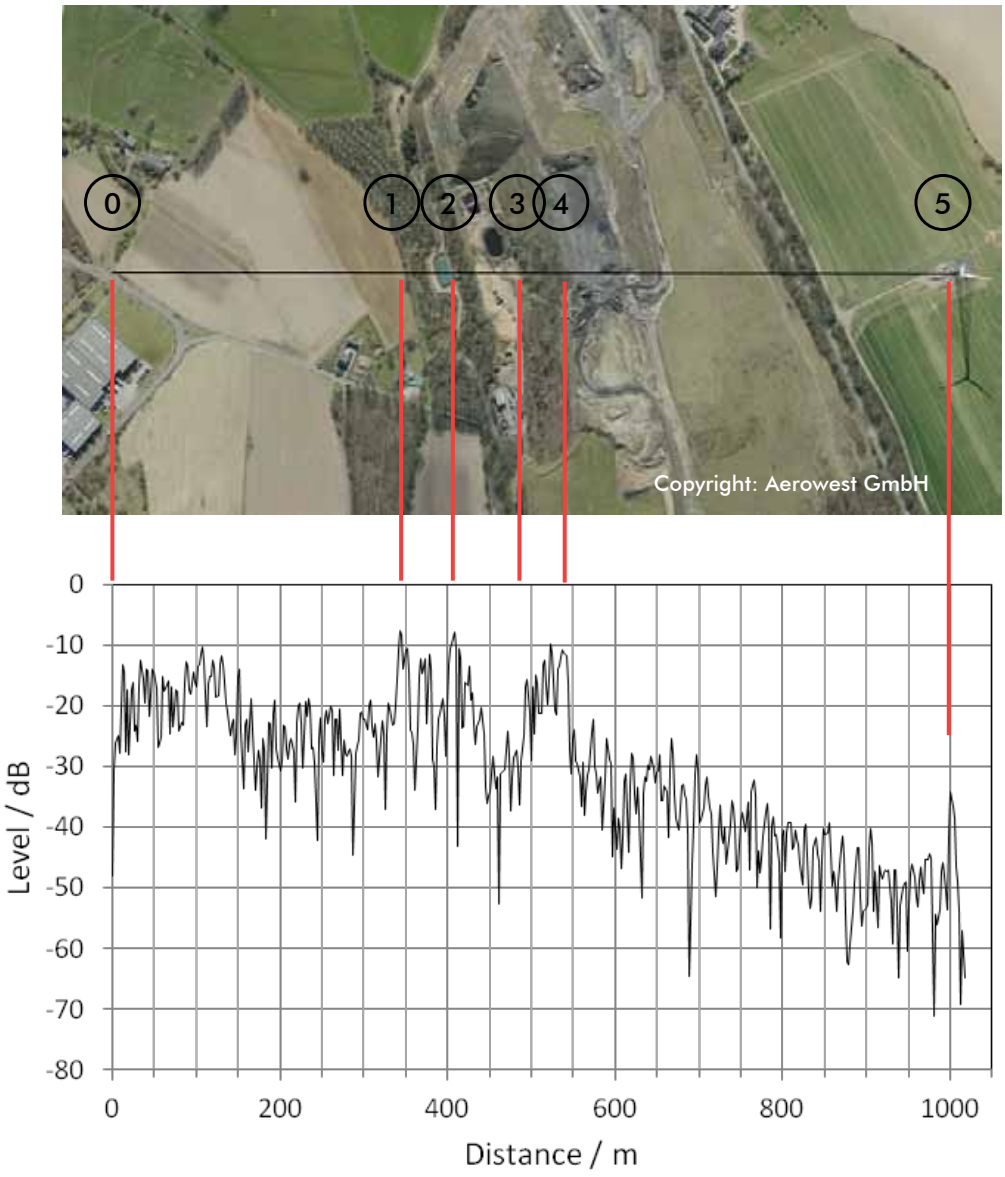
LANDSCAPE MEASUREMENTS WITH TWO HORN ANTENNAS

sR-1030 with RPC-2.92 connectors for external antennas (one Tx, two Rx)

OVERVIEW

sR-1030 is a 24 GHz FMCW radar module with no internal antennas but the capability to connect external antennas to the transmit and the two receive ports. Three RPC-2.92 coaxial connectors were mounted to the frontend board. In a field trial two standard gain horns (25dBi antenna gain and 8.5° 3dB beam-width) were used to carry out outdoor and long distances measurements. The goal was to get a radar image from characteristic landscape targets like slope of hills, trees and bushes, buildings, bridges, power poles or even wind engines. Such a scenario was measured close to IMST. The two horn antennas were mounted in a height of one meter with its monitoring area across an agricultural field. This field is rising slightly to a distance of 150m and descends smoothly up to a row of trees. A building follows while behind it an artificial hill rises from 25m to 70m. There is a plateau of about 50m width on top of that hill and a steep slope down to 30m. Behind the hill is another field and a wind engine in 1km distance. The measurements were made in December with no leaves on the trees and no crops on the fields. The radar data clearly show these significant landscape targets. The FMCW ramp was generated with 75MHz bandwidth and 1ms ramp time. The RF power of the radar module is adjustable and was set to 18dBm measured at the Tx connector. Port RX2 was terminated with 50 Ohms.

TECHNICAL DATA



DESCRIPTION		DISTANCE	HEIGHT
0	Position of radar module with Tx and Rx horn antenna	0 m	
1	Tree row behind an agricultural field	353 m	
2	Building / tree row	411 m	25 m
3	Bottom of hillside	495 m	35 m
4	Top plateau of artificial hill	542 m	70 m
5	Wind engine behind the hill	1030 m	

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