RADAR APPLICATION NOTE

BUILDING MEASUREMENTS WITH TWO HORN ANTENNAS

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

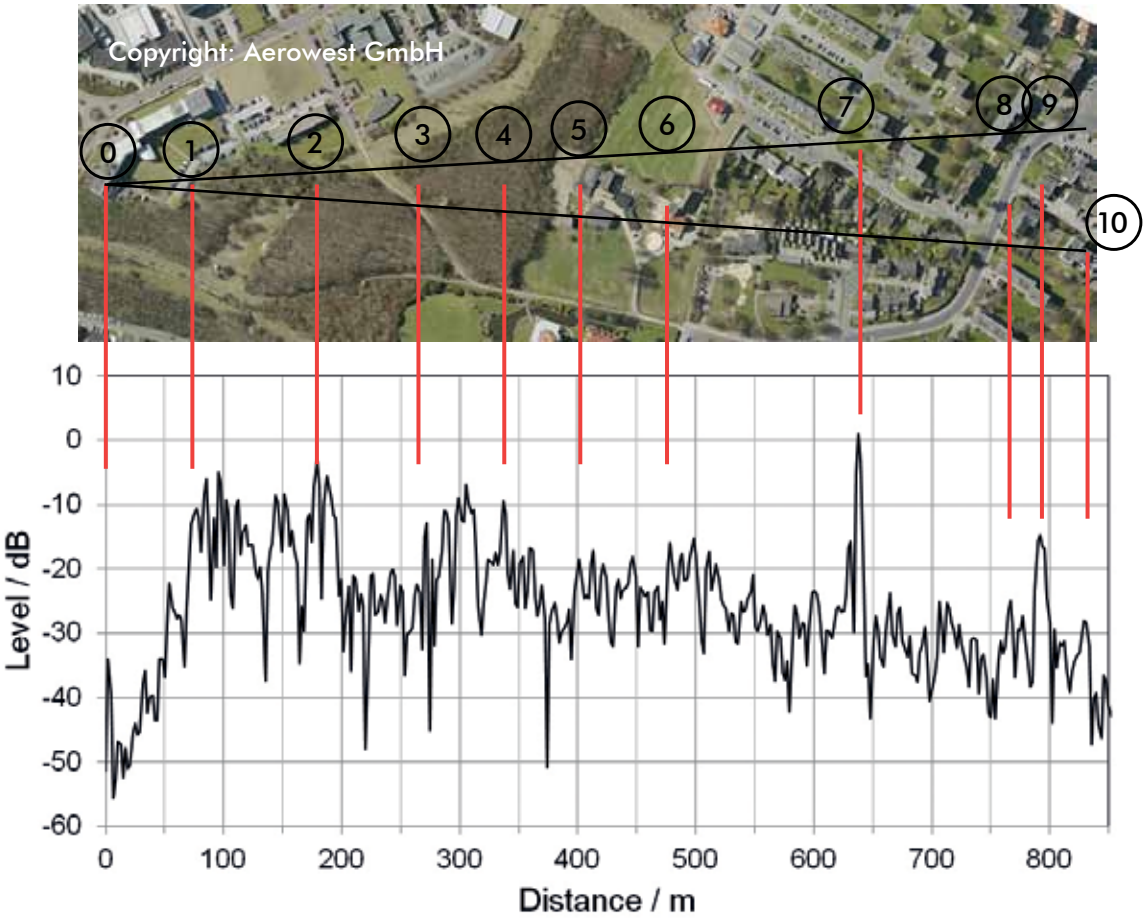
Landscape view

Standard gain horn

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 K-connectors were mounted to the frontend board. In a field trial two standard gain horns (25dBi antenna gain and 8.5° 3dB beam-width, 18-26.5GHz, WR-42 to K-connector) were used to carry out outdoor and long distances measurements. The goal was to get a radar image from characteristic landscape targets, buildings, trees and bushes. Such a scenario was measured from the roof of IMST's company building. The two horn antennas were mounted in a height of 14.3 meters slightly above the trees behind the backyard and parking area of IMST. Within the line-of-sight the upper parts of four apartment houses can be seen in a distance from 630 to 830 meters. The measurement peak at 630 meters is surprisingly high even though the building is close to the 3dB angle of the antenna beam and lower than the other buildings. Presumably the V-shaped position of the two blocks of the house result in excellent reflections. The measurements were made in December with no leaves on the trees. The radar data clearly show the characteristic landscape targets and buildings. 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	Radar with Tx and Rx horn antenna on top of IMST building	0 m	14.3 m
1	Trees behind lawn and 2 parking rows	80 m	
2	Tree row	175 m	
3	Tree row	255 m	
4	Trees		
5	Farm 1, buildings	400 m	
6	Farm 2, buildings	480 m	
7	Apartment building	630 m	4 stories
8	Apartment building with pitched roof	760 m	5 stories
9	Apartment building	780 m	8 stories
10	Apartment building	825 m	8 stories

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