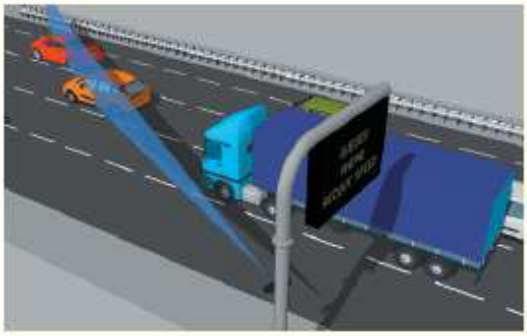
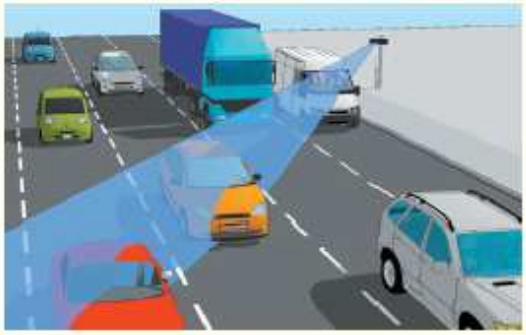
INTRODUCTION

TYPICAL APPLICATIONS

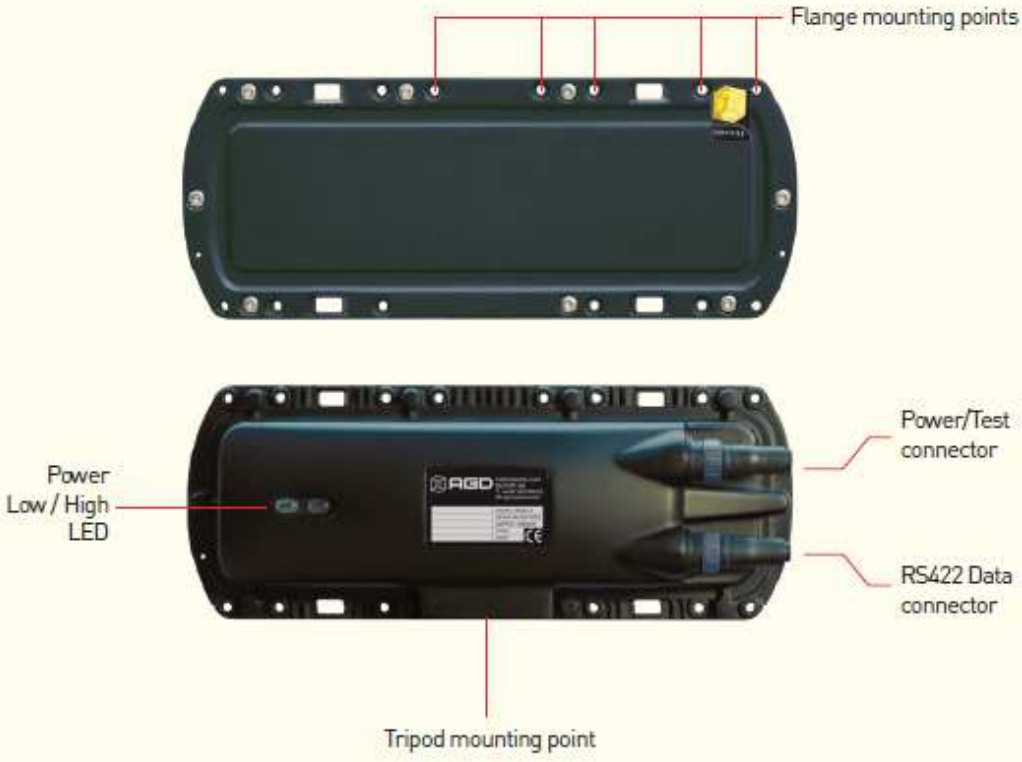
Multiple lane control from fixed infrastructure



Multiple lane control from mobile systems



PRODUCT OVERVIEW

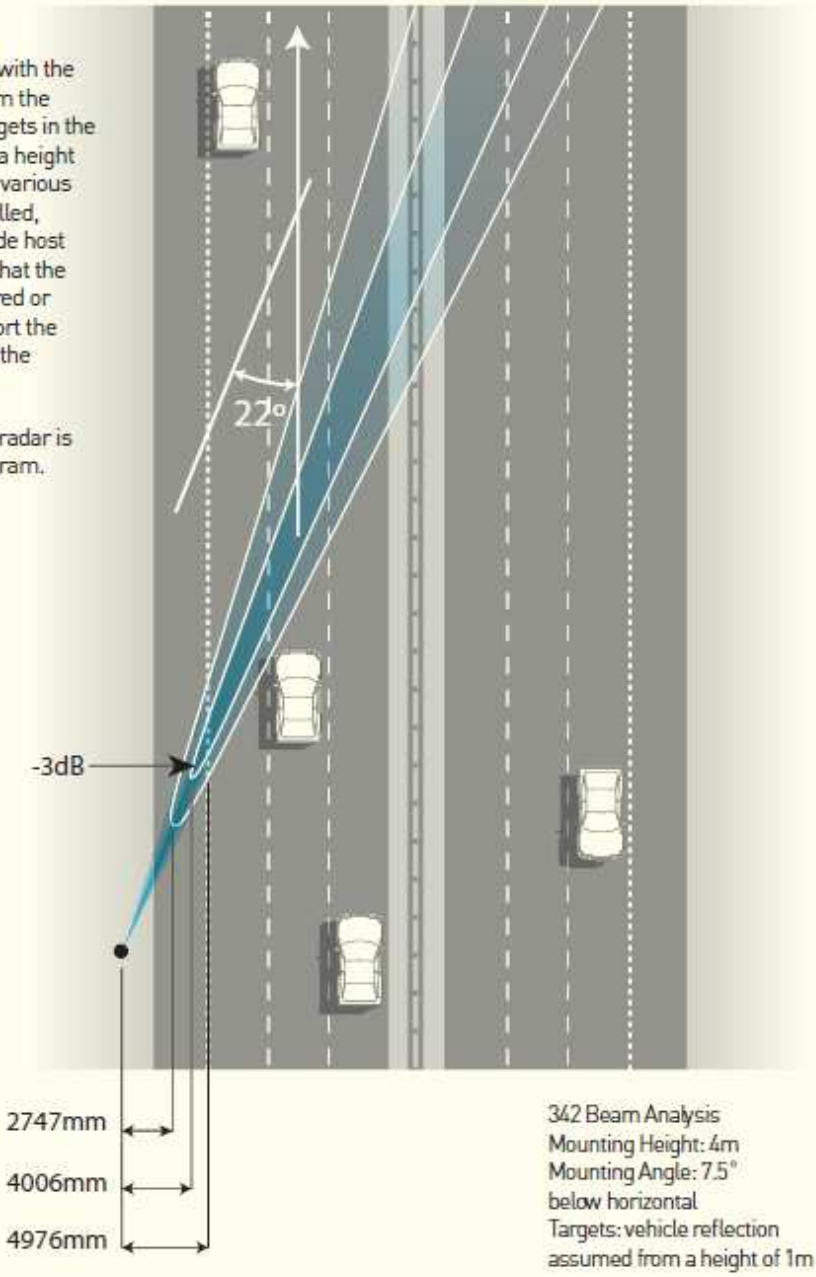


INSTALLATION

RADAR MOUNTING GEOMETRY

The radar is to be installed with the bore of the radar at 22° from the direction of travel of the targets in the lanes. It can be installed at a height in the range 1m to 5m with various considerations. When installed, especially if it is placed inside host equipment, it is important that the radar's radome is not covered or interrupted as this will distort the radar's beam and/or affect the sensitivity of the radar.

The typical coverage of the radar is shown in the following diagram.



342 Beam Analysis
Mounting Height: 4m
Mounting Angle: 7.5° below horizontal
Targets: vehicle reflection assumed from a height of 1m

INSTALLATION

RADAR MOUNTING HEIGHT

The radar can be installed at different heights but operation is best in the height range 1m to 3.5m. The radar can be mounted up to a height of 5m but it is important to understand that at these higher mounting heights the vertical cosine will affect the speed reading of the radar to progressively under-read for increasing heights for lanes that are too close to the radar.

It is therefore recommended that a minimum off-set, that is, a minimum perpendicular distance from the mounting position to the nearest enforceable lane is adopted as shown in the following table.

Mounting Height	Minimum Offset	Radar Declination Angle	Comment
1-2m	2m	0^0	
3m	3m	0^0	
4m	4m	7.5^0	TBC
5m	6m	7.5^0	TBC

SELECTING A SUITABLE SITE

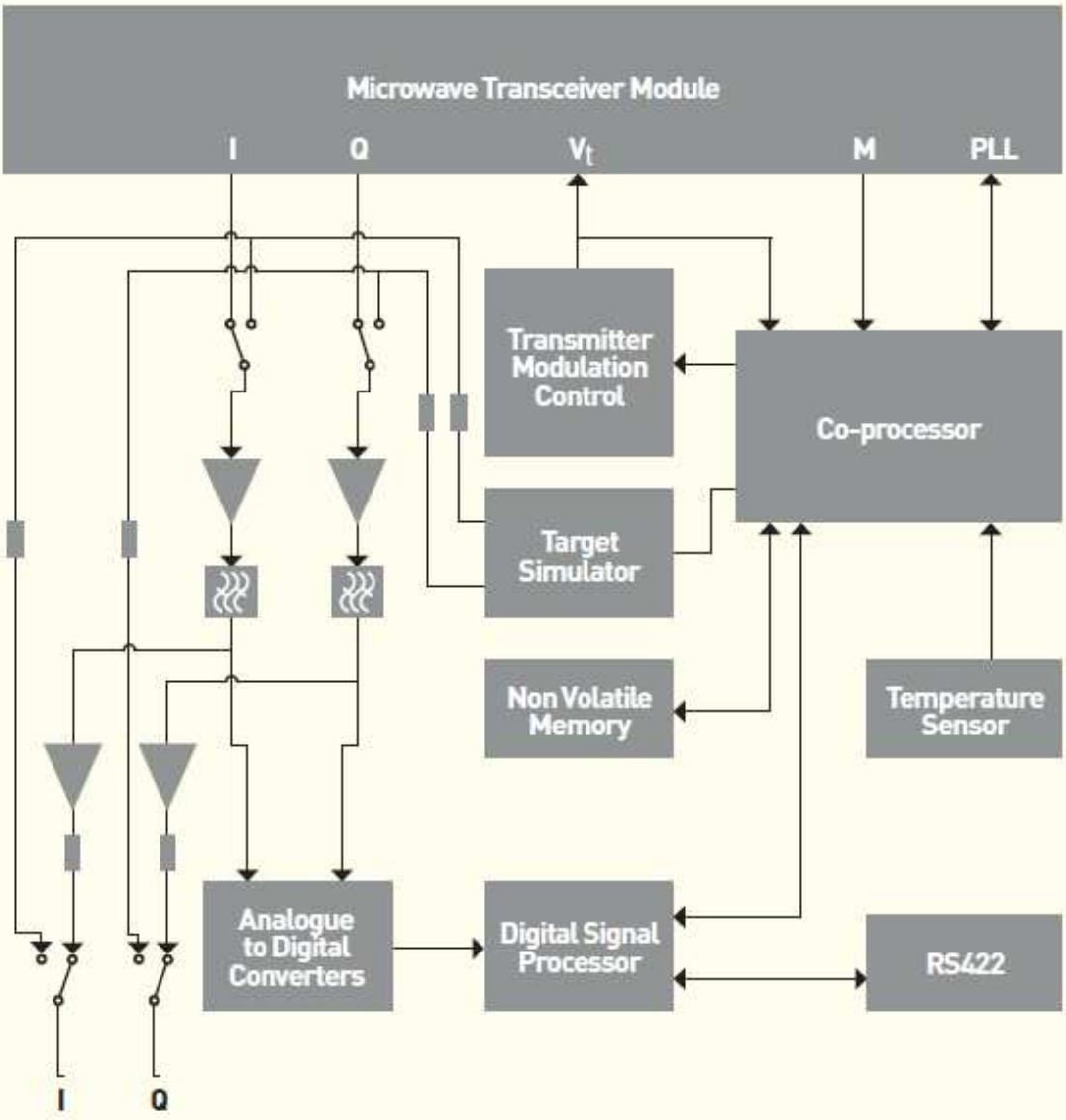
When choosing to deploy the radar on a site the following is a non-exhaustive list of considerations which should be taken into account;

- Do the lane(s) have a measurable radius which cause the vehicles to travel on an arc around the radar?
- Does the roads surface slope in a direction excessively which means deployment is not possible or needs to be accounted for in the set-up/alignment process of the radar.
- Is the nearest lane to be covered greater than the specified offset given the proposed deployment height for the radar?
- Are there any large reflecting surfaces directly in front or behind the radar mounting position?

RADAR MESSAGES IN NORMAL OPERATION

When the radar is installed and aligned correctly it will perform to specification.

SYSTEM HARDWARE OVERVIEW



Test Connections

SYSTEM HARDWARE OVERVIEW

RADAR CHARACTERISTICS

The radar has been designed to have a specific set of functional characteristics which make it suitable for speed measurements for enforcement applications.

Radar Antenna

The antenna design is a planar patch array with the following performance;

Parameter	Specified	Notes
Horizontal Beam-width	4.5°	-3dB (HPBW)
Vertical Beam-width	15°	-3dB (HPBW)
Side-lobe Suppression	>15dB	
E-Field	Horizontal	Plane Polarised

Operating Frequency Band and Power

The transmitter is a Phase Locked Loop (PLL) controlled MMIC based oscillator. The design confidence means that the nominal centre frequency of the transmission shall remain within a 10MHz window for the required 7 years for a radar functioning normally.

The change in frequency with temperature is measured to be ≤ ±1.21MHz over the operating temperature range -20°C to +60°C.

The radar frequency and power is as follows;

Parameter	Specified	Notes
Operating Frequency Band	24.075 – 24.125 GHz	
Frequency Modulation (FM)	9.4MHz	
Power	<100mW eirp	
Field Strength	Typically 450mV/m	At 3m
ITU Code	9M4FXN	