

Speed sensor



- Doppler radar based sensor
- Direction of motion identification
- Narrow beam pattern
- Range from 5m to 250m

Rotary switch programming

- Distance limitation by rotary switch 'gain'
- 14 speed thresholds by rotary switch 'prog'

Serial communication bus (1)

only if rotary switch 'prog' on C

Type	Color	Designation	Characteristics
RS232 standard	black	0V	Negative logic +12V / -12V
	red	+Vsupply	
	white	Rx on sensor	
	yellow	Tx on sensor	
RS485 option	black	0V	
	red	+Vsupply	
	white	Rx + on sensor	
	blue	Rx -	
	yellow	Tx + on sensor	
	green	Tx -	
UART option	black	0V	Positive logic +3.3V / 0V
	red	+Vsupply	
	white	Rx on sensor	
	yellow	Tx on sensor	

3 ON/OFF outputs (1)

Type	Color	Désignation	Caractéristiques
TOR	brown	Coming dir.	Open drain
	orange	Leaving dir.	Open drain
	grey	Overspeed	Open drain

(1) : RS232 is the standard in addition with the TOR outputs. RS485 or UART are available on request

Wiring

- Without enclosure (OEM), locking screw terminal blocks

Specifications

RF specifications

Frequency	24.15 to 24.25 GHz
Output power	100mW (EIRP<20dBm)
Antenna beamwidth	Horiz : 18° / Verti : 32°
Compliant with	EN300440

Performance

Velocity range	5km/h to 255km/h
Turn on time	500ms
Meas. refreshing time	50ms
Accuracy	± 1km/h
Sensitivity	Programmable gain

DC specifications

Supply voltage	from 9 to 30V
Supply current (typ. @ 12V)	89mA with detection 28mA without detection

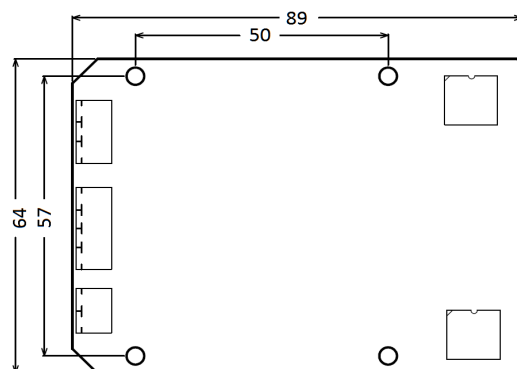
Mechanical specifications

Length	64mm
Thickness	22mm with connector
Width	89mm
Weight	50gr

Environmental conditions

Operating temperature	-40°C..+80°C
Storing temperature	-40°C..+80°C

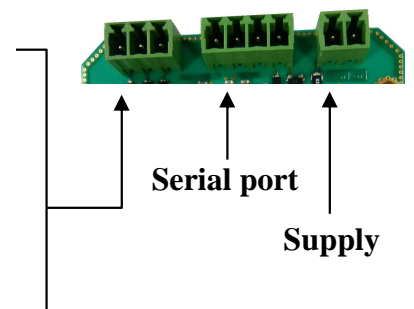
Mechanical drawing (mm)



TOR outputs (activ low)

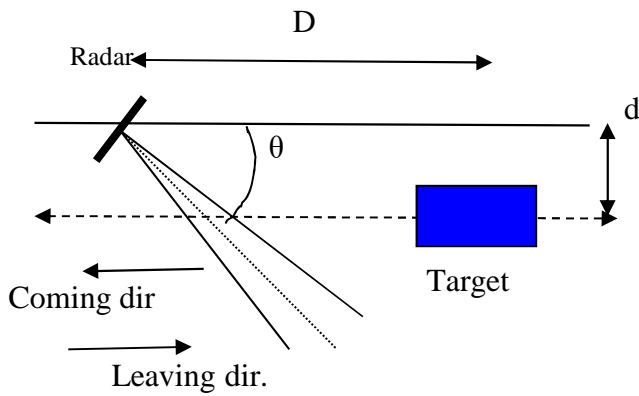
- Cd1 / coming dir. / blue led
- Cd2 / leaving dir. / yellow led
- Cd3 / overspeed / red led

- Operating defaults are reported by a simultaneous leds flash .
- A pull up resistance or a relais must be connected to the TOR



DOC0700-V3

Velocity measurement based on Doppler

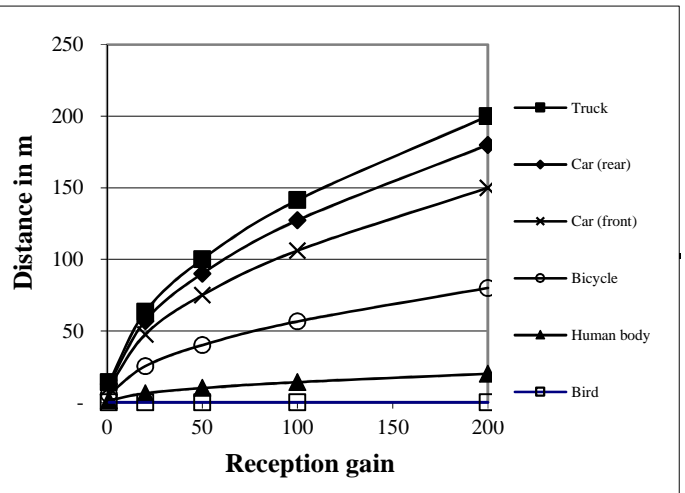
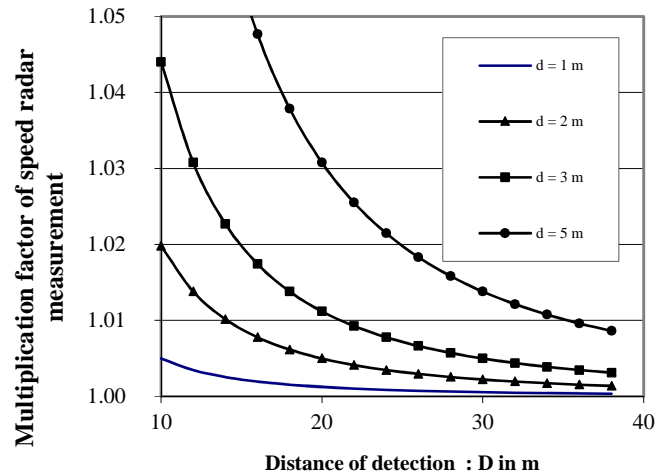


The speed measurement is obtained by the difference of the radar radiated frequency and the target reflected frequency.
 $Velocity = \frac{FDoppler \lambda}{2 \cos \theta}$

if $\theta < 10$ deg. error measurement is less than $\pm 2\%$ (see Diag. 1)
 if $\theta > 45$ deg. accuracy is poor.

A thinner beamwidth in the target moving plan, results in a more accurate speed measurement.
 To ensure greater accuracy, place the wide side of the sensor horizontally for measurements on the side of the road. For measurement from above, place the wide side of the sensor vertically.

Diag 1. Correction factor



Sensitivity

- The target reflectivity depends of its surface size and composition.
- Metallic surfaces are greatly reflective.
- The shape of a target can degrade its detection.
- Radar waves do not cross water films and metallic sheets, but can cross some walls or plastic sheets.
- Radar waves are slightly weakened by the rain and dirt.
- Only the waves reflected by moving target are detected by Doppler radar.
- Thin antenna beamwidth are more sensitive.

Communication bus : frame transmitted by the radar

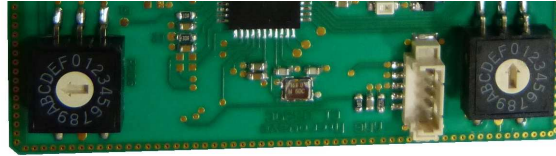
Byte 1	0xAA
Byte 2	0x55
Byte 3	NTR : frame N°
Byte 4	Cf/St
	o Bit 0 : 0 no filtering / 1 filtering
	o Bit 1 : 0 = coming dir. - 1 = leaving dir.
	o Bits 2 à 7 : free.
Byte 5	VPE : Velocity integer part
Byte 6	VPD : Velocity Decimal Part
Byte 7	Signal power (dBlsb)
Byte 8	Distance (m)
Byte 9	Distance limitation : programmed value copy
Byte 10	SV : speed threshold, programmed value copy

Communication bus : frame received by the radar

Byte 1	0xAA
Byte 2	0x55
Byte 3	Cf/St
	o Bit 0 : 0 no filtering / 1 filtering
	o Bit 1 and 2 : 1 = Comm. dir. - 2 = leav. dir. 3 - double dir
	o Bits 3 à 7 : free.
Byte 4	SV : speed threshold,
	TOR output = 1 if speed meas. is less than SV
Byte 5	Distance limitation : 30 to 250m. Other values : no limitation

RS232 : 9600 bps / 8 bits / 1 stop / no parity / no control

Rotary switch use



Rotary switch for software selection

Rotary switch for gain adjustment

Software configuration

Rotary switch value	Overspeed threshold	Range	Operation mode
0	0 km/h	Rotary switch	Vehicules detection, distance and overspeed threshold set by rotary switch
1	10 km/h		
2	20 km/h		
3	30 km/h		
4	40 km/h		
5	50 km/h		
6	60 km/h		
7	70 km/h		
8	80 km/h		
9	90 km/h		
A	100 km/h	RS232 config.	Vehicles detection, distance and overspeed threshold set by RS232. All parameters are stored in the sensor memory.
B	110 km/h		
C	RS232 config.	RS232 config.	Vehicles detection, distance and overspeed threshold set by RS232. All parameters are stored in the sensor memory.
D	120Km/h	Rotary switch	Vehicles detection, distance and overspeed threshold set by rotary switch
E	140Km/h		
F	Factory test	Factory test	This operating mode is reserved for factory tests.

Distance configuration

Rotary switch value	Distance limitation		Rotary switch value	Distance limitation
0	No limitation		8	80
1	10 *		9	90
2	20 *		A	100
3	30 *		B	110
4	40 *		C	120
5	50 *		D	130
6	60		E	140
7	70		F	150

* : In distance limitation inferior to 50m, targets detection cannot always be guaranteed

DISCLAIMER :

Different technical specifications are possible upon request, AMG reserves the right to make modifications to the design and characteristics of the product at any time and without prior notice