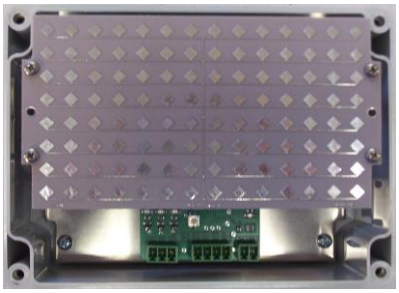


Speed sensor

RoHS

- Doppler radar based sensor
- Direction of motion identification
- Narrow beam pattern
- Presence or motion detection

Rotary switch programming

- Sensitivity by rotary switch 'gain'
- 7 speed thresholds by rotary switch 'prog'

Serial communication bus (1)

only if rotary switch 'prog' on C

Type	Color	Designation	Characteristics
RS232 standard	brown	0V	
	white	+Vsupply	
	blue	Rx on sensor	Negative logic
	yellow	Tx on sensor	+12V / -12V
RS485 option	brown	0V	
	white	+Vsupply	
	blue	Rx + on sensor	
	black	Rx -	
	yellow	Tx + on sensor	
	green	Tx -	
UART option	brown	0V	
	white	+Vsupply	
	blue	Rx on sensor	Positive logic
	yellow	Tx on sensor	+5V / 0V

3 ON/OFF outputs (1)

Type	Color	Designation	Characteristics
TOR	brown	Coming dir.	Open drain
	white	Leaving dir.	Open drain
	blue	Overspeed	Open drain

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

Wiring

- As OEM, delivered with locking screw terminal blocks
- Enclosed in polycarbonate cover, delivered with a 2m cable

Specifications

RF specifications

Frequency	24.15 to 24.25 GHz
Output power	1 mW (EIRP<20dBm)
Antenna beamwidth	Horiz : 6° / Verti : 9°
Compliant with	EN300440

DOC264-001-V2A

Performance

Velocity range	1.5 km/h to 100 km/h
Turn on time	400 ms
Meas. refreshing time	200 ms
Accuracy / resolution	± 1 km/h (see notes *)
Resolution	0.1 km/h

DC specifications

Supply voltage	from 9 to 30V
Supply current (typ. @ 12V)	70 mA

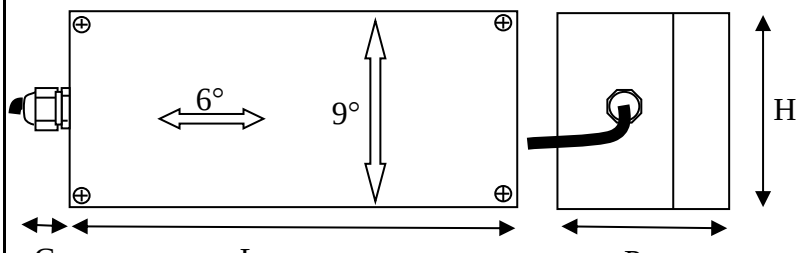
Mechanical specifications

Enclosure material (optional)	Polycarbonate
Weight	500 g
Electrical connection	wires

Environmental conditions

Operating temperature	-20°C..+60°C
Storing temperature	-40°C..+70°C
Protection classification	IP65

Mechanical drawing with cover (mm)

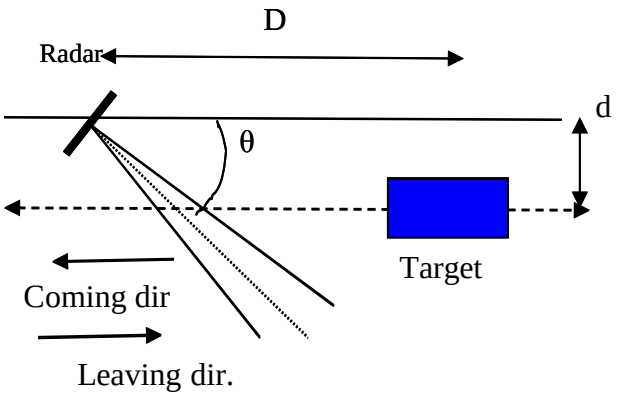


L	P	H	C
160	90	120	30

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 outputs.

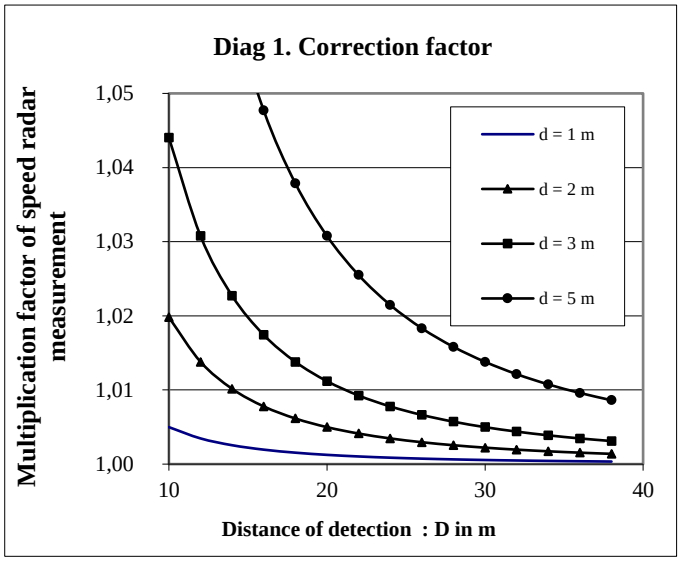
Velocity measurement based on Doppler

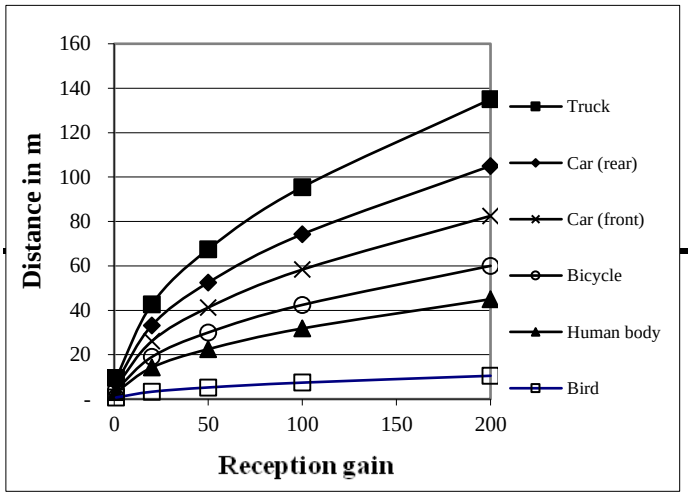


The speed measurement is obtained by the difference of the radar radiated frequency and the target reflected frequency.
Velocity = FDoppler λ / (2 cos θ)

if θ < 10 deg. error measurement is less than à 2% (see Diag. 1)
if θ > 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.





Communication bus : frame transmitted by the radar	
Byte 1	0xAA
Rotary swit	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 Bits2 à 7 : free.
Byte 5	**VPE :** Velocity integer part
Byte 6	**VPD :** Velocity decimal part
Byte 7	OK : Not used
Byte 8	HT : Not used
Byte 9	**GAIN :** 255 gain step, 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 et 2 : 1 = Com. dir. – 2 = leav. dir. – 3 double dir.
	o Bits3 à 7 : free.
Byte 4	**SV :** speed threshold,
	TOR output = 1 if speed meas. is less than SV
Byte 5	**GAIN :** 255 gain step from 1 to 255

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

Sensitivity

.● The target reflectivity depends of its surface size and composition
.● Metallic surfaces are greatly reflective
.● The target shape 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 the dirt
● Only the waves reflected by moving target are detected by Doppler .radar
.● Thin antenna beamwidth are more sensitive

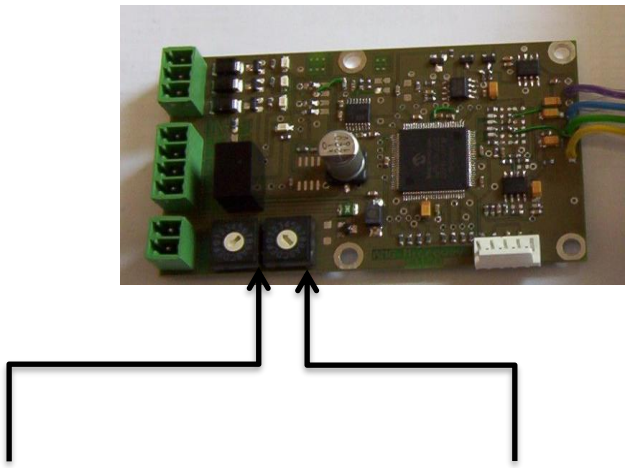
Programmable gain

Byte 4	Gain	Byte 4	Gain	Byte 4	Gain
0	0,12	9	1	23 à 26	2,27
1	0,25	10	1,06	27 à 32	2,67
2	0,31	11	1,14	33 à 41	3,2
3	0,37	12	1,23	42 à 55	4
4	0,5	13	1,33	56 à 84	5,33
5	0,56	14 à 15	1,46	85 à 169	8
6	0,68	16 à 17	1,6	170 à 254	16
7	0,75	18 à 19	1,78	255	24
8	0,87	20 à 22	2		

Notes

* According to conditions of installation

Rotary switch use



Rotary switch for software selection

Rotary switch for gain adjustment

Software configuration

Rotary switch value	Overspeed threshold	Operation mode
0	0	Vehicle detection, overspeed threshold of 0km/h, rotary switch gain programming.
1	30	Vehicle detection, overspeed threshold of 30km/h, rotary switch gain programming.
2	50	Vehicle detection, overspeed threshold of 50km/h, rotary switch gain programming.
3	70	Vehicle detection, overspeed threshold of 70km/h, rotary switch gain programming.
4	90	Vehicle detection, overspeed threshold of 90km/h, rotary switch gain programming.
5	110	Vehicle detection, overspeed threshold of 110km/h, rotary switch gain programming.
6	130	Vehicle detection, overspeed threshold of 130km/h, rotary switch gain programming.
7		Not used
8		Not used
9		Not used
A		Not used
B		Not used
C	Conf through RS232	Vehicle detection, programming (overspeed, Gain) through serial communication bus
D	Conf through RS232	Speed display on hyper terminal
E	Conf through RS232	Doppler signals and FFT display on Hyper Terminal
F	Conf through RS232	Software version and configuration display, debug mode

Gain configuration

Rotary switch value	Gain prog.
0	1
1	4
2	9
3	16
4	25
5	36
6	49
7	64

Rotary switch value	Gain prog.
8	81
9	100
A	121
B	144
C	169
D	196
E	225
F	256