

ARS 430FM - FlexMount Long range radar sensor 77GHz

Object detection – designed for moving vehicles – flexible mounting – auto calibration – CAN interface

Specifications:

- Maximum detection range: 250 m up to 1200 m
- Azimuth coverage: $\pm 60^\circ$ near range, $\pm 9^\circ$ far range
- Velocity range: -400 km/h ... +200 km/h
- Communication interface: CAN-HS, 500 kbps / 1 Mbps
- Cycle time: ~72 ms
- Power supply: 12 V / 24 V
- Power consumption: 6.6 W / 550 mA
- Operating temperature: -40 °C ... +85 °C
- Size: 138 x 91 x 31 mm
- Weight: ~ 300 g
- Robust housing: IP 6k 9k

Features:

- **Object detection:** high-performance detection with tracking, validation, and classification of cars, trucks, motorcycles, bicycles, and pedestrians
- **Object filtering:** multiple filters, including a 4-point polygon “area of interest” filter and property-based filters (velocity, classification, radar cross section) to reduce CAN bus load
- **Area monitoring:** monitors up to 8 configurable polygon areas and issues warnings when objects enter.
- **Flexible mounting:** mountable front, rear, side, or corner; supports proper tracking with speed and yaw-rate input
- **Multi-sensor setup:** up to 8 sensors on one CAN network without message collision; 360° mounting with unified vehicle coordinates
- **Auto calibration:** detects and compensates mounting-angle deviations
- **CAN interface:** configurable to 500 kbps or 1 Mbps; outputs up to 100 tracked objects

Typical areas of application:

- **Traffic monitoring:** object tracking for smart city or highway
- **Collision avoidance:** object detection for mining, motorsport or logistics
- **Distance control:** automation for farming, transport or railway
- **Area monitoring:** object warning for, agriculture, off-highway, or aviation

Input data:

- **Sensor configuration:** baud rate, message control, maximum range, object sorting
- **Mounting configuration:** sensor positions and angles
- **Ego vehicle speed & yaw rate:** for object tracking on moving vehicles
- **Filter configurations:** multiple object properties
- **Polygon filter:** flexible area filtering
- **Area monitoring:** polygon zone configuration

Output data:

- **Sensor status:** error and status signals
- **Tracked objects:** position, velocity, acceleration, radar cross section, classification, etc., for up to 100 objects
- **Auto calibration:** status and misalignment angles
- **Area warning:** zone- and object-based warnings



Measuring performance	Comment	To natural targets (non-reflector targets)
Distance range		0.20 ...250 m far range, 0.20...70m/100m@0...±45° near range and 0.20...20m@±60° near range
Resolution distance measuring	point targets, no tracking	Up to 1.79 m far range, 0.39 m near range
Accuracy distance measuring	point targets, no tracking	±0.40 m far range, ±0.10 m near range
Azimuth angle augmentation	(field of view FoV)	-9.0°...+9.0° far range, -60°...+60° near range
Elevation angle augmentation	(field of view FoV)	14° far range, 20° near range
Azimuth beam width (3 dB)		2.2° far range, 4.4°@0° / 6.2°@±45° / 17°@±60° near range
Resolution azimuth angle	point targets, no tracking	1.6° far range, 3.2°@0° / 4.5°@±45° / 12.3°@±60° near range
Accuracy azimuth angle	point targets, no tracking	±0.1° far range, ±0.3°@0° / ±1°@±45° / ±5°@±60°near range
Velocity range		-400 km/h... +200 km/h (- leaving objects...+approximation)
Velocity resolution	target separation ability	0.37 km/h far field, 0.43 km/h near range
Velocity accuracy	point targets	±0.1 km/h
Cycle time		app. 72 ms near and far measurement
Antenna channels / -principle	microstripe	4TX/2x6RX = 24 channels = 2TX/6RX far - 2TX/6RX near / Digital Beam Forming

Operating conditions	Comment	To natural targets (non-reflector targets)
Radar operating frequency band	acc. ETSI & FCC	76...77 GHz
Mains power supply	at 12 V DC	+8,0 V...32 V DC
Power consumption	at 12 V DC / 10 A fuse	6.6 W / 550 mA typ. and 12 W / 1.0 A @max. peak power
Load dump protection internal		disconnection >60 V and re-start returning to <60 V
Operating-/ storage temperature		-40°C... +85°C / -40°C... +90°C
Lifetime	acc. LV124 part 2 - v1.3	10000 h or 10 years (for passenger cars)
Shock	mechanical	500 m/s2@6 ms half-sine (10 x shock each in +/-X/Y/Z dir.)
Vibration	mechanical	20 [(m/s2)2/Hz] @10 Hz / 0,14 [(m/s2)2/Hz] @1000Hz (peak)
Protection rating	ISO 16750 Classification (Trucks) for vibration	IIP 6k 9k (dust, high-pressure cleaning) IP 6k7 (10 cm under water), ice-water shock test, salt fog resistant, mixed gas EN 60068-2-60



Connections	Comment	To natural targets (non-reflector targets)
Monitoring function		self-monitoring
Interface	up to 8 ID	1 x CAN - high-speed 500 kbit/s / 1 Mbit/s

Housing	Comment	To natural targets (non-reflector targets)
Dimensions / weight	L * W * H (mm) / mass (g)	138 * 91 * 31 / app. 300 g
Material	housing front / backcover	PBT GF 30 black (BASF-Ultradur B4300G6 LS sw 15073) / AC-47100 (AlSi12Cu1(FE)) die cast aluminium or EN AW 5754 (3.535) AlMg3 pressed-formed aluminium

Miscellaneous

Measuring principle (Doppler's principle) in one measuring cycle due basis of FMCW with very fast ramps independent measurement of distance and velocity.

Version: ARS430FM

Customization: Special firmware adaption can be offered on demand.

