

# Radar sensor

## MWC25M-L2M-B20-V15



- CAN bus with SAE J1939 protocol
- Sensing range up to 25 m
- Degree of protection IP68 / IP69
- High EMC resistance
- Sensor head bidirectional and rotatable
- Robust metall fastening

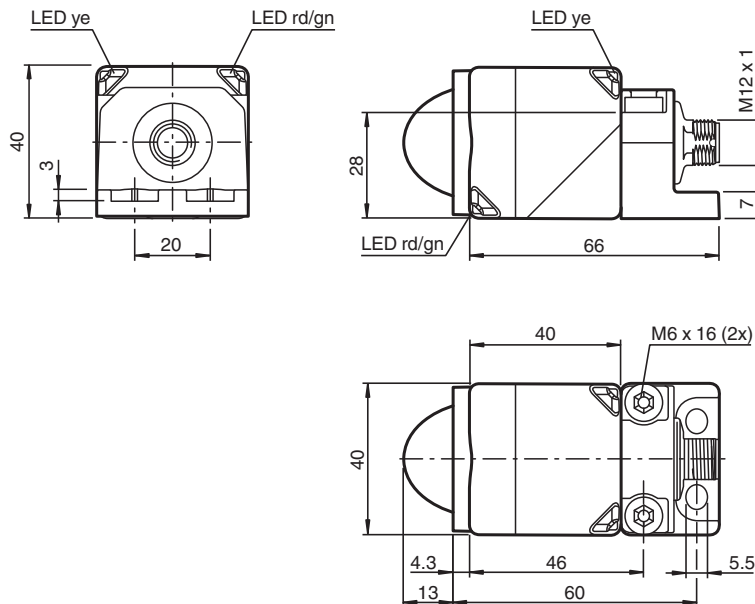
Radar sensor for distance and velocity measuring up to 25 m measuring range



### Function

The radar sensor series MWC25M with J1939 interface for medium distances up to 25 m range is optimized for use in industrial applications. Its compact cubic housing of the L2 series is proven in many industrial areas due to its high robustness. Via Parameter Group Numbers (PGNs), you can directly parameterize the radar sensor optimally for your application. Alternatively, parameterization with extended functionality is also possible using the FDT framework program PACTware and a DTM. This allows you to additionally use various evaluation and filter settings for distance and velocity values. The radar sensor operates according to the frequency modulated continuous wave (FMCW) method in the ISM band at 122 ... 123 GHz, approved for industrial use. In doing so, it emits a continuous radar signal that is varied over the frequency range of the ISM band. With this method, the sensor is able to reliably detect the distance and velocity of static and moving objects. When measuring velocity, the radar sensor detects the velocity of an object in the radial direction only, without measuring tangential velocities or velocity parts.

### Dimensions



### Technical Data

#### General specifications

|                      |      |
|----------------------|------|
| Measuring technology | FMCW |
|----------------------|------|

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Pepperl+Fuchs Group  
www.pepperl-fuchs.com

USA: +1 330 486 0001  
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 1111  
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091  
fa-info@sg.pepperl-fuchs.com

**PEPPERL+FUCHS**

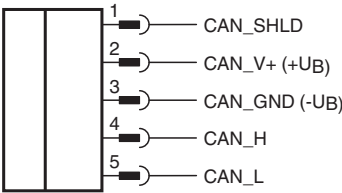
## Technical Data

|                                                 |                |                                                                            |
|-------------------------------------------------|----------------|----------------------------------------------------------------------------|
| Measured variable                               |                | distance<br>velocity                                                       |
| Measurement range                               |                |                                                                            |
| Distance                                        |                | 0.5 ... 25 m                                                               |
| Velocity                                        |                | 0.1 ... 80 m/s                                                             |
| Dead band                                       |                | 0 ... 0.5 m                                                                |
| Standard target plate                           |                | corner reflector 100 mm edge length                                        |
| Working frequency                               |                | 122.25 ... 123 GHz                                                         |
| Opening angle                                   |                | < 12 ° (see characteristic curve)                                          |
| Transmitter radiated power (EIRP)               |                | < +20 dBm                                                                  |
| Sampling rate                                   |                | 1 ... 200 Hz , programmable                                                |
| <b>Nominal ratings</b>                          |                |                                                                            |
| Linearity error                                 |                | < ± 0.1 % of full-scale value (linearity error incl. temperature drift)    |
| Repeat accuracy                                 | R              | 1 mm                                                                       |
| Resolution                                      |                | distance 1 mm<br>velocity 0.01 m/s                                         |
| Time delay before availability                  | t <sub>v</sub> | ≤ 400 ms                                                                   |
| <b>Functional safety related parameters</b>     |                |                                                                            |
| Performance level (PL)                          |                | up to PL c                                                                 |
| MTTF <sub>d</sub>                               |                | 310 a                                                                      |
| Mission Time (T <sub>M</sub> )                  |                | 20 a                                                                       |
| Diagnostic Coverage (DC)                        |                | up to 60 % , see functional safety manual                                  |
| <b>Indicators/operating means</b>               |                |                                                                            |
| LED yellow                                      |                | object within measuring range                                              |
| LED red/green                                   |                | J1939 status display                                                       |
| <b>Electrical specifications</b>                |                |                                                                            |
| Operating voltage                               | U <sub>B</sub> | 9 ... 32 V                                                                 |
| No-load supply current                          | I <sub>0</sub> | ≤ 100 mA                                                                   |
| Power consumption                               | P <sub>0</sub> | typ. 0.4 W , max. 1 W                                                      |
| <b>Interface</b>                                |                |                                                                            |
| Interface type                                  |                | J1939                                                                      |
| Protocol                                        |                |                                                                            |
| Process data                                    |                | status register<br>distance<br>signal quality<br>cycle counter<br>velocity |
| Transfer rate                                   |                | 250 kBit/s , 500 kBit/s , programmable                                     |
| Termination                                     |                | external                                                                   |
| Supported baud rates                            |                |                                                                            |
| <b>Compliance with standards and directives</b> |                |                                                                            |
| Standard conformity                             |                |                                                                            |
| Standards                                       |                | EN 301489-1<br>EN 301489-3<br>EN 305550-1<br>EN 62368-1<br>EN 62311        |
| <b>Approvals and certificates</b>               |                |                                                                            |
| UL approval                                     |                | cULus                                                                      |
| FCC approval                                    |                | CFR Title 47, Part 15<br>FCC ID: IRE-MWL2A                                 |
| ISED approval                                   |                | IC ID: 7037A-MWL2A<br>HVIN/PMN: MWL2A                                      |
| <b>Ambient conditions</b>                       |                |                                                                            |
| Ambient temperature                             |                | -40 ... 70 °C (-40 ... 158 °F)                                             |
| Storage temperature                             |                | -40 ... 85 °C (-40 ... 185 °F)                                             |
| <b>Mechanical specifications</b>                |                |                                                                            |

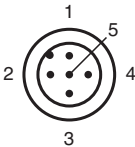
Technical Data

|                      |  |                                                |
|----------------------|--|------------------------------------------------|
| Connection type      |  | Connector plug                                 |
| Degree of protection |  | IP68 / IP69                                    |
| Material             |  |                                                |
| Housing              |  | PA-GF35<br>powder coated metal mounting flange |
| Radome               |  | PTFE                                           |
| Connector            |  |                                                |
| Threading            |  | M12 x 1                                        |
| Number of pins       |  | 5                                              |
| Mass                 |  | 180 g                                          |
| Dimensions           |  |                                                |
| Height               |  | 40 mm                                          |
| Width                |  | 40 mm                                          |
| Length               |  | 83.3 mm                                        |
| Factory settings     |  |                                                |
| Default setting      |  | PGN "Distance and velocity"                    |
| Sampling rate        |  | 50 Hz                                          |
| Transfer rate        |  | 250 kBit/s                                     |

Connection

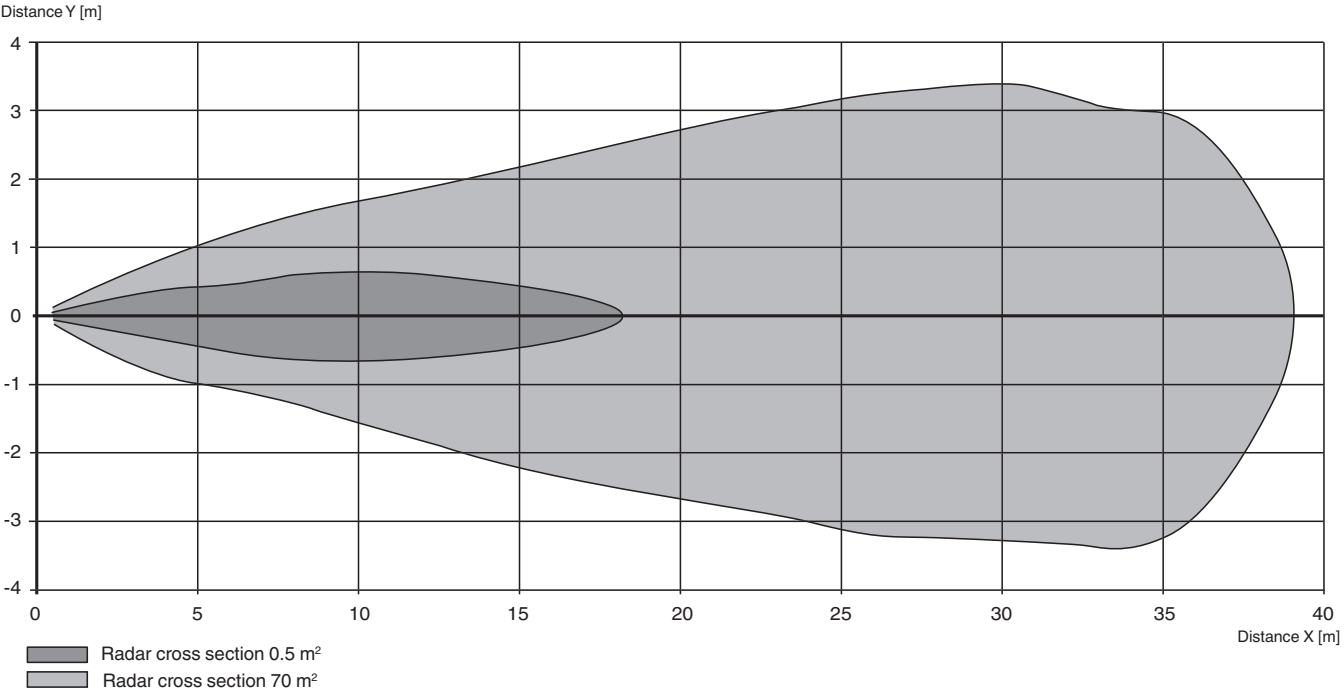


Connection Assignment



Characteristic Curve

Characteristic response curve radar sensor



Technical Features

Emitted Interference and Interference Immunity Specifications

| Mains-Borne Interference in Accordance with ISO 7637-2 |   |    |    |    |    |   |   |    |    |
|--------------------------------------------------------|---|----|----|----|----|---|---|----|----|
| Pulse                                                  | 1 | 2a | 2b | 3a | 3b | 4 | 5 | 5a | 5b |
| Failure criterion                                      | A | A  | C  | A  | A  | A | A | A  | A  |

| Interference Immunity | Coupling  | Level   | Failure Criterion |
|-----------------------|-----------|---------|-------------------|
| ISO 11452-2           | –         | 30 V/m  | –                 |
| EN 61000-4-2          | Contact   | 8 kV    | A                 |
|                       | Air       | 15 kV   | A                 |
| EN 61000-4-3          | –         | 11 V/m  | A                 |
| EN 61000-4-4          | Direct    | 1,1 kV  | B                 |
|                       | Capacitiv | 2,2 kV  | B                 |
| EN 61000-4-6          | –         | 15 V    | A                 |
| EN 55011              | Contact   | Class B | –                 |
| EN 55011              | Radiation | Class B | –                 |

Accessories

Accessories for this product can be found on the internet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".