



MIAL[®]
INSTRUMENTS PVT.LTD.
Measuring & Beyond

MRL

MIAL RADAR LEVEL METER



Measuring & Beyond



www.mialinstruments.com



Mial Radar Level Meter

DESCRIPTION

The 80 GHz Radar Level Gauge is an advanced non-contact level measurement system based on Frequency Modulated Continuous Wave (FMCW) radar technology. It continuously transmits electromagnetic waves toward the material surface, where the signals are reflected back to the antenna. The radar determines the distance between the antenna and the material surface by analyzing the frequency difference between the transmitted and reflected signals. This enables accurate and reliable level measurement without direct contact with the process medium.

Compared with conventional 24 GHz pulse radar, 80 GHz FMCW radar provides continuously transmitted signals, resulting in higher average transmitted power and an improved signal-to-noise ratio. This enables reliable detection over greater distances and delivers more stable measurements, particularly in challenging applications such as high-dust environments.

The 80 GHz radar technology offers high accuracy, strong signal performance, reliable long-distance measurement, and stable operation, making it suitable for a wide range of industrial level measurement applications.

APPLICATIONS

Water & Wastewater:

Level measurement in water tanks, reservoirs, and wastewater treatment systems.

Chemical & Petrochemical:

Suitable for process and storage tanks containing chemicals, oils, and other liquids. Non-contact measurement helps reduce maintenance requirements.

Food & Pharmaceutical:

Suitable for storage and process vessels where clean and reliable measurement is required. Non-contact technology helps minimize contamination risks.

High-Dust Applications:

Designed for challenging environments with dust, buildup, or condensation. Advanced radar technology provides stable and dependable level measurement.

Industrial Storage:

Suitable for continuous level measurement of liquids, powders, and granular materials. Provides reliable measurement over long distances



MRL Mial radar Level Meter - integral Model



MRL - POM Enclosure Mial radar Level Meter(Non - Display Type)



MRL - SS Enclosure Mial radar Level Meter (Non - Display Type)

FEATURES

High-Frequency Antenna:

Millimeter-wave radar achieves measurement accuracy of ± 1 mm with a 50 mm blind zone.

Compact Antenna Design:

Smaller antenna size accommodates a wider range of operational environments.

Superior Penetration Capability:

Superior penetration capability ensures reliable operation even in applications with buildup or condensation.

Wide Dynamic Signal Range

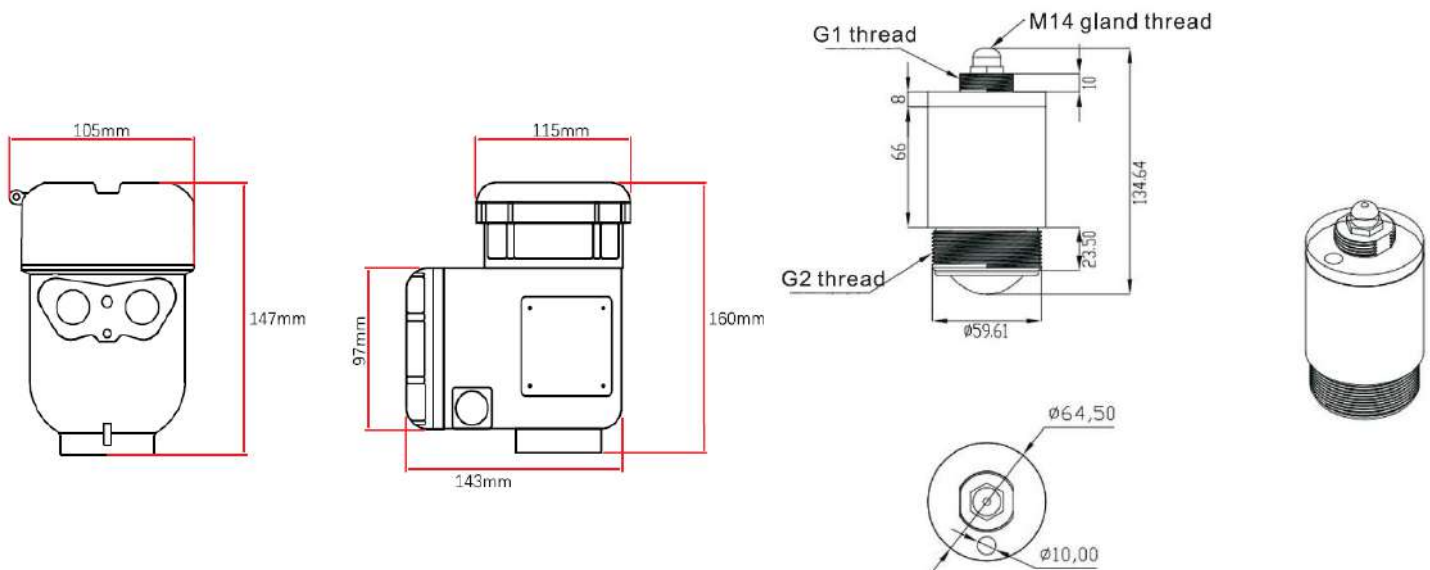
A wider dynamic signal range delivers more stable measurements on materials with low dielectric constants.

Fast Radar Response

Multiple measurement modes are available, with radar response times as fast as 300 ms.

BENEFITS OF MIAL RADAR LEVEL METER

- ± 1 mm measurement accuracy for precise level monitoring.
- 50 mm blind zone enables dependable measurement in a wide range of applications.
- Focused 3° beam angle provides stronger and more reliable echo signals.
- Superior penetration capability maintains reliable operation despite buildup or condensation.
- Wide dynamic signal range ensures stable measurement even with low-dielectric-constant materials.
- Radar response time as fast as 300 ms enables quick detection of level changes.
- Flexible measurement modes allow the radar to adapt to different process conditions.



MRL Dimensions



MRL specifications* (Integral Model)

Measurement Principle

FMCW (Frequency Modulated Continuous Wave)
Radar

Installation Methods

Threaded: 1.5" / 3.5

Beam Angle

Thread 1.5": 8°

Thread 3.5": 3°

Measurement Range

Threaded: 0–30 m
(0-5m,0-12m,0-20m,0-30m)

Process Pressure

Threaded 1.5": 1 MPa

Threaded 3.5": 1 MPa

Medium Temperature

Threaded 1.5": 100°C

Threaded 3.5": 100°C

Ambient Temperature

–40°C to +80°C

Antenna Type

Lens antenna

Measurement Accuracy

±1 mm

Output Format

2-wire, 4–20 mA, HART, RS485

Commissioning Method

Button-based commissioning

Electrical Interface

M20 × 1.5

Power Supply Range

24 VDC

Power Consumption

≤0.6 W

Protection Rating

IP66

Housing Material

Aluminum (MRL - Dual Chamber)

SS (MRL - Non Display)

POB (MRL - Non Display)

Specifications are subject to change without prior notice *

MRL specifications*

(Non- Display)

Housing Material

PTFE / ABS

Seal Between Housing and Cover

Silicone rubber

Two-Wire System

24 VDC / 4–20 mA

Power

Four-Wire System

12 VDC / Modbus-RS485

Reserved Cable

4 m / 5 m

Output Signal

4–20 mA / RS485

Communication Protocol

Modbus

Resolution

1 mm

Blind Zone

0.1 m

Maximum Measurement Distance

30 m (0–5m,0–12m,0–20m,0–30m)

Modulation Frequency

80 GHz

Measurement Interval

Minimum 300 ms, depending on parameter settings

Adjustment Time

Automatic

Display Resolution

1 mm

Operating & Storage Temperature

–40°C to +80°C

Process Temperature – Antenna Section

–40°C to +80°C

Pressure

Atmospheric pressure

Shock Resistance

Vibration frequency: 10–150 Hz

Maximum vibration acceleration: 10 m/s²

Specifications are subject to change without prior notice *

ORDERING CODE

Meter Model Coding = MRL-OO-AA- B-C-D-E-F-G

Product Name

Mial radar Level meter = MRL

OO = Model

Dual Chamber with Display = 01

SS Enclosure MRL w/o Display = 02

POM Enclosure MRL w/o Display = 03

AA=Measuring

5m =05

12 m = 12

20 m = 20

30 m = 30

B= Process Connection

1 = Threaded

C =Power Supply

1 = 24 VDC

D=Signal Output

1 = 2-wire, 4-20 mA, HART, RS485

2=2- Wire / 4-20 mA

3=4-Wire / Modbus

E = Shell material

1 = Cast Aluminum (standard)

2 = POB

3 = Stainless Steel

F = Explosion Proof

1 = YES

2 = NO

G = Structure

1 = With Display (Integral)

2= Without Display



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All future orders will adhere to the standard specifications outlined in the order code, ensuring consistency and quality across items