

# Micropilot® FMR10 Free Space Radar Liquid Level Sensor

## Overview



Part No. [FMR10-CAQBMVCEE2](#)

The Endress+Hauser Micropilot FMR10 pulsed radar liquid level sensor provides reliable, continuous, non-contact level measurement for liquids in storage tanks, open basins, pump lift stations, cooling towers, and canal systems. The Micropilot FMR10 can be configured to provide a 4-20mA analog output for liquid levels up to 8 meters (26.25 ft) or 12 meters (39.37 ft) when the flooding protection tube accessory is installed. Configuration and operation of the Micropilot FMR10 is accomplished using its Bluetooth wireless technology interface and the Endress+Hauser SmartBlue mobile app which, includes a linearization function that allows the conversion of the measured value into any unit of length, weight, flow, or volume. Envelope curves of the process can also be displayed and recorded using SmartBlue. The Micropilot FMR10 PVDF sensor body

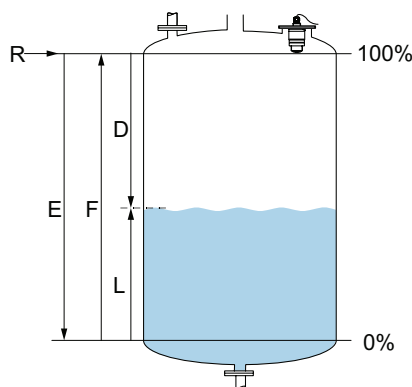
has 1-1/2" male NPT process connection threads and is IP66/68 and NEMA 4X/6P rated with hermetically sealed wiring and fully potted electronics to eliminate water ingress and allow operation under harsh environmental conditions. The Micropilot is powered from nominal 24VDC power and electrical connections are made via the 2-wire, unshielded, 10m (32 ft) cable. Available accessories include an adjustable mounting bracket for easy wall or ceiling installation, a protective sensor cover to protect from direct sunlight in outdoor applications, and a flooding protection tube that is required when the Micropilot FMR10 is installed in free space (not in an enclosed tank), a greater measuring range is required, or to ensure the sensor measures the maximum level even if it is completely flooded.

## Features

- Pulsed radar level sensor for continuous, non-contact liquid level measurement
- 4-20mA analog output
- Liquid levels up to 8 meters (26.25 ft) or 12 meters (39.37 ft) with the flooding protection tube accessory installed
- Configuration and operation with Bluetooth wireless technology and the Endress+Hauser SmartBlue mobile app
- SmartBlue linearization function to convert the measured value into any unit of length, weight, flow, or volume
- Display and recording of process envelope curves with SmartBlue
- PVDF sensor body with 1-1/2" male NPT process connection threads
- IP66/68 and NEMA 4X/6P rated
- Electrical connections via the 2-wire, unshielded, 10m (32 ft) cable
- Nominal 24VDC powered

## Operation

The Micropilot FMR10 is a downward-looking sensor that emits 26 GHz radar pulses towards the surface of the liquid and measures the length of time (time of flight) for the pulse to reflect off the liquid surface and return to the Micropilot sensor. Because the distance to the liquid surface is proportional to the time of flight, the liquid level above a known empty distance can be determined. Configuration of the empty distance and full distance, as well as other parameters, is accomplished via Bluetooth wireless technology and the Endress+Hauser SmartBlue mobile app.



Level calibration parameter

- E Empty calibration (= zero)
- F Full calibration (= span)
- D Measured distance
- L Level ( $L = E - D$ )
- R Reference point

With maximum radiated pulse power of 5.7 mW and an average power output of 0.015 mW, the Micropilot FMR10 is ideal for use in metallic and non-metallic tanks. Free space operation (not in an enclosed tank) is also possible when the flooding protection tube accessory is installed. When used in outdoor applications, the radar signal from the Micropilot is immune to cross-wind effects that can cause loss of signal for ultrasonic level sensors.

Optimal performance will be reduced by certain application characteristics that interfere with or prevent the Micropilot from receiving the pulses reflected from the liquid surface. In general, the following application characteristics should be avoided. Refer to the Micropilot FMR10 Operating Instructions for specific details regarding application, installation, and operation.

### Application characteristics to avoid:

- Tank height < 1.5 m (5 ft)
- Open channel width < 0.5 m (1.6 ft)
- Media with bad reflective properties (Relative dielectric constant  $\epsilon_r < 4$ )
- Agitated surfaces
- Foam layer
- Formation of buildup, particularly of moist products
- Heavy condensation
- Freezing of the sensor
- Obstructions such as limit switches, temperatures sensors, baffles, heating coils, liquid filling curtain, etc.

## Approvals



Download the free Endress+Hauser SmartBlue  
Mobile App for phone or tablet:



Micropilot FMR10 Free Space Radar						
Model	Description	Weight (lbs)	Price	Drawing Link	Vendor Specs	Vendor Operating Manual
<b><u>FMR10-CAQBMVCEVEE2</u></b>	Endress+Hauser Micropilot pulsed radar liquid level sensor, 8m (26.3) or 12m (39.4 ft) with flooding protection tube sensing range, 4-20mA, 10.5-30 VDC operating voltage, 1-1/2in male NPT process connection.	4.01	\$793.00	<a href="#">PDF</a>	<a href="#">PDF</a>	<a href="#">PDF</a>

Note: For Wiring and Installation information refer to the additional Vendor Specs and Operating Information PDFs.

## Accessories

Part No. [52025686](#)Part No. [71325090](#)Part No. [71325079](#)

Micropilot FMR10 Free Space Radar Accessories					
Model	Description	Price	Weight (lbs)	Drawing Link	
<b><u>52025686</u></b>	Endress+Hauser protective cover, for use with Endress+Hauser Micropilot FMR10 pulsed radar liquid level sensor.	\$76.00	0.28	<a href="#">PDF</a>	
<b><u>71325090</u></b>	Endress+Hauser flooding protection tube, for use with Endress+Hauser Micropilot FMR10 pulsed radar liquid level sensor.	\$115.00	0.46	<a href="#">PDF</a>	
<b><u>71325079</u></b>	Endress+Hauser adjustable mounting bracket, for use with Endress+Hauser Micropilot FMR10 pulsed radar liquid level sensor.	\$98.00	0.73	<a href="#">PDF</a>	

- The protective sensor cover protects the FMR10 from direct sunlight in outdoor applications
- The flooding protection tube is required when the Micropilot FMR10 is installed in free space (not in an enclosed tank), when a greater measuring range is required, or to ensure the sensor measures the maximum level even if it is completely flooded
- The adjustable mounting bracket allows easy wall or ceiling installation