ChannelFlo™ OCRM

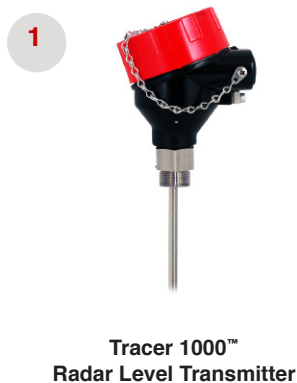## GUIDED WAVE RADAR OPEN CHANNEL FLOW METER

Description

The ChannelFlo™ OCRM flow meter is an all-in-one solution preconfigured for open channel flow. The Tracer 1000 radar level meter and DigaTouch/eXmod display are coupled together to form the OCRM meter. As a stand alone meter, the Tracer 1000 has range of 2 inches to 65 feet and a 4-20mA output. Easy mounting and a one-piece feed through makes this a rugged sensor that can withstand up to 302°F and 580 PSIG pressure. Remote email alerts and data logging make this meter a wise choice for remote locations as well.

Features & Benefits

- Revolutionary TDR Technology
- High accuracy (+/- 0.12mm) with NO moving parts
- Dead Band (Top & Bottom) 1.5"
- Probe guided radar impulses for ease of flow measurement in narrow channels
- Isolated 4-20 mA, 4 10A relay outputs and 1 PNP transistor output plus RS-485 Serial communication, and Ethernet communication
- 6 digit red LED display with touch screen interface and remote monitoring/configuration software (included)

The OCRM meter includes

Tracer 1000™
Radar Level Transmitter

DigaTouch™
Advanced Universal
Process Display

eXmod™
Relay Expansion Module

Technology

The OCRM meter uses TDR Technology: low-energy, high-frequency electromagnetic impulses, generated by the sensor's circuitry. These impulses are propagated along the probe which is submerged in the liquid to be measured. When these impulses hit the surface of the liquid part of the impulse energy is reflected back up the probe to the circuitry which then calculates the fluid level from the time difference between the impulses sent and the impulses reflected. Because the microwave impulses are unaffected by pressure, temperature, steam, or fog, the OCRM meter is accurate even in harsh conditions.

Electrical Specifications	
Output Functions	Continuous level measurement through analog output and point level detection through switching output.
Analog Output (Active)	Current output 4-20mA: The span between the lower range value [4mA] and the upper range value [20mA] is equal to 0-100% of the continuous level measurement reading. It is recommended that the span between those two range values stays within the measuring range [M].
Total Load Resistance	< 500Ω: HART resistor approx. 250Ω + load resistance approx. 250Ω if the current output is connected to a device with an inner resistance of approx. 250Ω, then there is no additional, external HART resistor necessary. In that case, the HART modem is connected in parallel to the current output wires.
Lower Range Value	4.0mA (span 0%)
Upper Range Span	20.0mA (span 100%)
Response Time	0.5s (default), 2s 5s (selectable)
Temperature Drift	Less than .0078 in/°F change in ambient temperature
Switching Output DC PNP (Active)	NC (default) or NO (short-circuit protected)
Load Current	< 200mA
Supply Voltage	12-30VDC (reverse-polarity protected)
Current Consumption	< 50mA at 24 VDC (no burden)
Start-Up Time	< 6s
Cable Terminals	Screwless, cage clamp terminal block for stranded and solid wires AWG 22-14 *The usage of cable end sleeves with insulation collar is not recommended*

Measurement Specifications	
Accuracy	± 0.12" or 0.03% of measured distance, whichever is greatest
Repeatability	< .08"
Resolution	< .04"
Probe Type	316 SS Rod: 1/4"
Probe Length [L]	316 SS Rod: 4" - 240" *(Length must be specified when ordering - The reference point is always the sealing surface of the connection thread - See dimensional drawings)*
Top Dead Band	Configurable below 1.5"
Bottom Dead Band	Configurable above 1.5"

Application Specifications	
Measuring Range [M]	Probe length [L] less both inactive areas at top and bottom [l1 and l2] in this range Tracer 1000™ will have the specified measurement performance. It is recommended that the maximum and minimum liquid levels to be measured are within the measuring range [M] of the sensor.

Application Specifications	
Dielectric Constant [εr]	316 SS Rod: > 1.8
Conductivity	No restrictions
Density	No restrictions
Dynamic Viscosity	316 SS Rod: < 5.00mPa s = 5.000cP
Standard Application Temp.	F: -40° to 302° C: -40 to 150°
Ambient Temperature	F: -13° to 176° C: -25° to 80°
Application Pressure	-14.50 PSI to 580 PSI
Velocity of Level Change	< 3.2 fps
Interface (i.e. oil on top of water)	An oil layer of < 2.8" thickness on top of water is not detected by the sensor; in this case the sensor will detect only the water level at a slightly lower position than actual. From an oil layer thickness > 2.8" onwards, the sensor detects the total level, including the oil layer, according to specifications.

Mechanical Specifications	
Material Exposed to Tank Atmosphere	316 SS Rod: 1.4404 / 316L and PEEK Gasket at connection thread: Klingersil C-4400, 0.1" thick
Enclosure Material	Aluminum alloy EN AC-AISi9Cu3 (DIN EN 1706), Epoxy Spray (~70μm)
Enclosure Rating	Standard: NEMA 6

Specifications are subject to change without notice.

Tracer 1000™ Specifications Continued

Cable Glands/Screw Plugs	1/2" NPT (2) or Cable Glands (2) or 1/2" NPT (1) & Cable Gland (1) or M20 x 1.5 (2) or M20 x 1.5 (1) & Cable Gland (1)
Connection Thread [CT]	3/4" NPT (US) or 3/4" G (Metric)
Weight	Aluminum housing, assembled with electronics and feedthrough: 950g Aluminum housing (empty): 650g
Certification	Standard: NEMA 6 (IP66 / IP68), General Purpose

Probe Type Recommendations

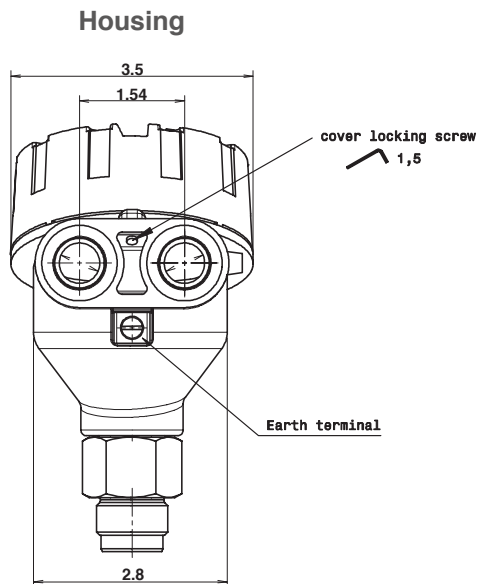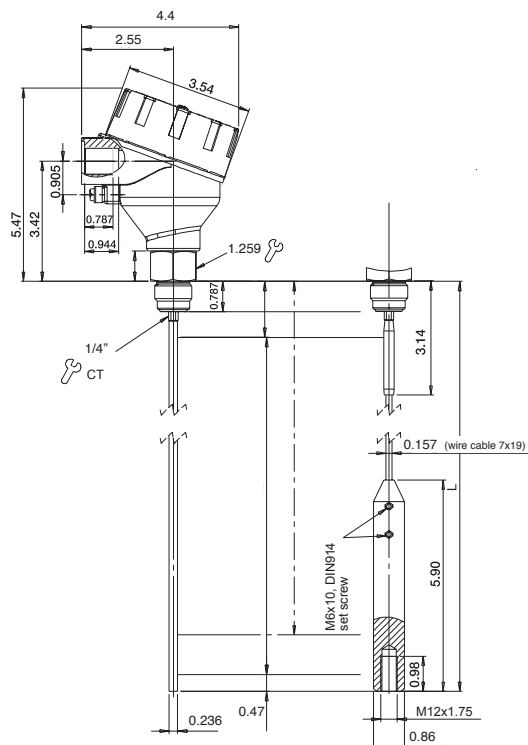| 316 SS ROD PROBE	
PROBE MOUNTING	
Tall & narrow nozzles	•
Difficult tank or nozzle geometries	•
Close to internal tank structures or tank wall	•
Probe might move or touch internal tank structures/tank wall	•
Liquid spray may touch probe above the liquid surface	•
Non-stationary interface targets, e.g. agitator blades	•
Measurement readings at the very top or bottom of the tank	•
Non-metallic tanks	•
Bypass chambers and stilling wells	+
Limited headroom for installation	•
Tall tanks	•
MEDIA CHARACTERISTICS	
Bulk solids	-
Measuring low reflectivity liquids (i.e. low dielectric constant)	•
Viscous, crystallizing, adhesive, coating, or sticky liquids	+
Fibrous liquids, sludge, slurry, pulp	+
Liquids containing solid particles	+
Clean-ability of probe is important	+

+ = Recommended

• = Possible, maybe with configuration and/or mounting adjustments

- = Not recommended

Dimensions (Inches)

Housing

316 SS Rod Probe

Display Type	6-digit, Red LED
Display Units	Engineering
Decimal Point	Up to 5 places
Display Output	-99999 to 999999
Status Indicators	(1) Totalizer, Yellow LED (4) Relay, Red LED
Display Height	0.6" (15 mm)
Over Range	Display flashes HIGH and Max. Display Value
Under Range	Display flashes LOW and Min. Display Value
User Interface	Four touch screen buttons or DigaLink PC Windows® Software
Display Refresh Rate	Once Per Second (1/s)
Password	Programmable, restricts modification of settings
Operating Temperature	F: 32° to 140° C: 0° to 60°
Storage Temperature	F: -40° to 185° C: -40° to 85°
Relative Humidity	0 to 90° non-condensing
Accuracy	±0.1% of calibrated span ± count
Temperature Drift	0.005% of calibrated span/° C max from 0 to 65°C ambient; 0.01% of calibrated span/°C max from -40 to 0° C ambient
Supply Voltage	AC Supply: 90-265 VAC @ 50-60 Hz, 15W Max. DC Supply: 12-28 VDC @ 0.5A (Fuse protected via 0.5A slow blow)

Transmitter Power	120 mA @ 24 VDC 24 VDC for AC powered units; For DC powered units, supply voltage equals the DC input voltage
Pulse Input	1 to 24 VDC, 1 to 3000 Hz
Frequency Input	125 mV to 12 VAC, 1 to 30 KHz
Digital Input	Remote total reset
Analog Input	4-20 mA current loop, 0-5 VDC, 1-5 VDC, 0-10 VDC
Analog Output	Isolated 4-20 mA current loop
Connection	Removable screw terminal Accepts 12-22 AWG Wire
Enclosure Type	Field Mount Model
Field Mount Enclosure Rating	NEMA 4X
Enclosure Material	Polycarbonate
Classification	General Purpose
Communications	
Serial Port	RS-485, Screw Terminal
Ethernet Port	10/100 Base-T (RJ-45)

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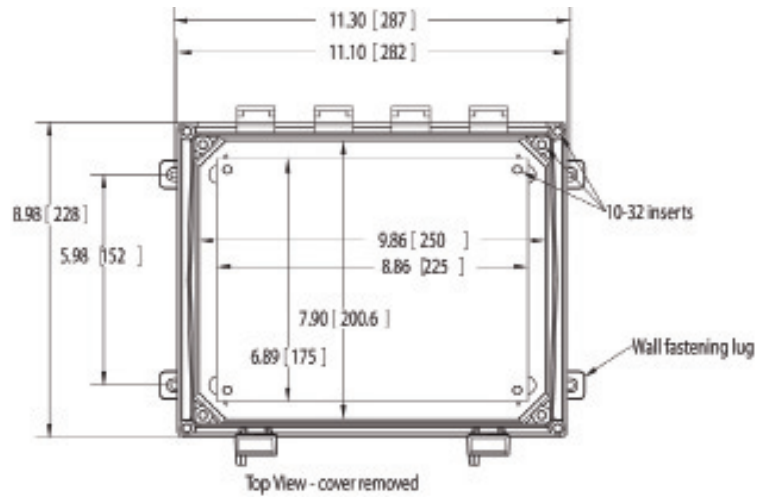
Dimensions Inches (mm)
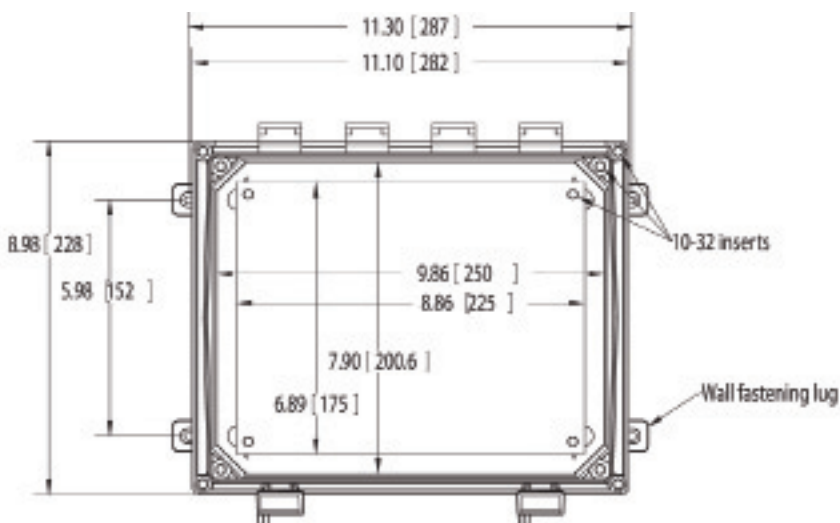
3 eXmod™ Specifications

Status Indicators	(4) Red LED Relay Indicators
User Interface	4 internal DIP Switches Used To Select ModBus® Address
Contact Form	SPDT
Relay Rating	5A @ 28 VDC; 5A @ 120/240 VDC at Max Ambient Temperature; NO Contact Rated at 10A @ 20˚C
Operating Temperature	F: -40° to 149° C: -40° to 85°
Storage Temperature	F: -40° to 149° C: -40° to 85°
Relative Humidity	0-90%, non-condensing
Supply Voltage	12-24 VDC
Connection	Removable Screw Terminal; Accepts 12-22 AWG Wire
Enclosure Type	Field Mount
Enclosure Rating	NEMA 4X (IP65)
Enclosure Material	Polycarbonate
Classification	General Purpose

Specifications are subject to change without notice.

Dimensions Inches (mm)

11.30 [287]
11.10 [282]
8.98 [228]
5.98 [152]
9.86 [250]
8.86 [225]
7.90 [200.6]
6.89 [175]

10-32 inserts
Wall fastening lug

Top View - cover removed

Maximize The ROC's Performance

DigaLink™ E-mail Alerts Configuration & Monitoring Software
DigaLink™ 3.0 is FLO-CORP's unique Alarm, Configuration and Monitoring Software. This enables users to receive e-mail alerts, configure, and remotely monitor from the convenience of their PC. DigaLink is unique in it's communication protocol that utilizes both TCP/IP Ethernet communication and Modbus/RS485 serial communication simultaneously. This advanced software features e-mail alerts, display configuration, datalogging and real-time monitoring from unlimited devices. With DigaLink you can easily setup, monitor and receive e-mail alerts from practically anywhere.
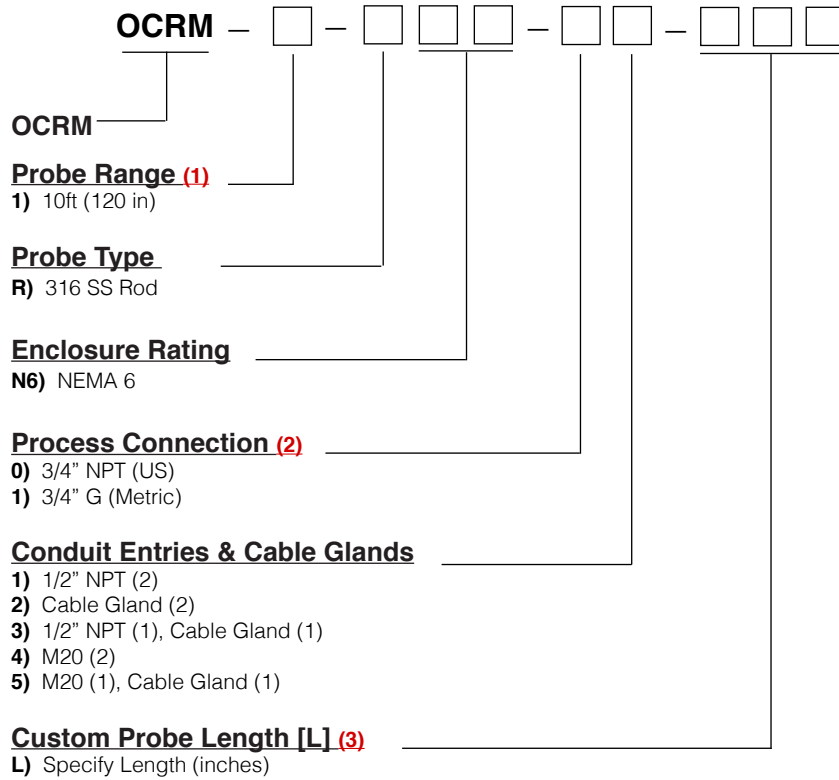
Ordering Information

Use the diagram below, working from left to right to construct your FLO-CORP Model Number.
Simply match the category number to the corresponding box number.

Example: OCRM-1-RN6-01-120   *The ChannelFlo™ OCRM Meter with 10ft Probe Range, 316 SS Rod Probe Type, NEMA 6 Enclosure, 3/4" NPT Process Connection, 1/2" NPT Conduit Entries & Cable Glands, 120" Custom Probe Length*

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OCRM

Probe Range (1)
1) 10ft (120 in)

Probe Type
R) 316 SS Rod

Enclosure Rating
N6) NEMA 6

Process Connection (2)
0) 3/4" NPT (US)
1) 3/4" G (Metric)

Conduit Entries & Cable Glands
1) 1/2" NPT (2)
2) Cable Gland (2)
3) 1/2" NPT (1), Cable Gland (1)
4) M20 (2)
5) M20 (1), Cable Gland (1)

Custom Probe Length [L] (3)
L) Specify Length (inches)

Ordering Notes:
(1) If a longer probe is required, please contact factory.
(2) For special process connections (i.e. flange, size, connection type) please contact factory.
(3) Specify the L-dimension at the end of the model number (ie: OCRM-1-RN6-00-**120"**-N). The L-dimension must be specified in inches (in) and fall within the 'Probe Range' selected.

* Additional probe lengths may be available upon request - Please contact factory.