

MCG 1600SFI

Smart Flash Infrared Radar Gauge

The MCG 1600SFI Smart Flash Infrared Radar Gauge delivers custody-grade accuracy, safety, and operational efficiency for terminals, refineries, chemical plants, and EPC projects requiring high-reliability tank measurement. It provides ± 0.5 mm accuracy, withstands extreme temperatures and pressures, and maintains performance in corrosive, viscous, foaming, or vapor-laden products. Full hazardous-area certifications, non-contact FMCW radar technology, and ground-level access enhance safety and reduce operator risk. Custom antennas optimize performance for any tank condition, while plug-in protocol emulation streamlines integration with legacy or modern control systems. Infrared handheld calibration eliminates the need for laptops or tank-top access, and a guided setup wizard enables commissioning within minutes. With wide communication flexibility, global approvals, and drop-in retrofit capability, the MCG 1600SFI ensures stable measurement, reduced engineering time, and long-term reliability across diverse storage, process, and custody-transfer environments.



Key Features

FMCW Radar Performance:

Continuous frequency sweeps provide smooth, high-resolution, non-contact measurement while minimizing false echoes from vapor, foam, turbulence, or internal obstructions.

Custody Accuracy & Resolution:

± 0.5 mm accuracy with 0.1 mm resolution ensures dependable billing integrity and early detection of shrinkage, leaks, or evaporation losses.

Wide Range Capability:

Measures up to 180 ft with electronics operating -40°C to $+65^{\circ}\text{C}$ and antennas rated -100°C to $+250^{\circ}\text{C}$ for extreme product and climate conditions.

Pressure Versatility:

Supports atmospheric and pressurized tanks up to 300 PSIG, covering spheres, bullets, reactors, and sealed process vessels.

Flexible Communications:

Supports Modbus, HART, WirelessHART, 4–20 mA, and Tankway for seamless retrofit, multi-vendor integration, and system modernization.

Optimized Antenna Options:

Parabolic, Cone, Conar, and stilling-well antennas ensure reliable measurement across varying dielectric constants, tank geometries, and internal obstructions.

Typical Applications



CUSTODY TRANSFER:

Provides ±0.5 mm accuracy for audit-ready billing, reconciled inventories, and protection against costly measurement disputes or product imbalance.



CHEMICAL STORAGE:

Stainless and coated antennas ensure stable measurement in corrosive, foamy, or viscous liquids, preventing product loss and maintaining environmental compliance.



OIL & GAS TANKS:

Offers consistent, high-accuracy readings that support balanced custody, transparent trade, and reduced financial reconciliation challenges.



CRYOGENIC SERVICE:

Wide temperature capability enables safe measurement of LNG, LPG, ethylene, and other low-temperature products with high reliability.



HIGH-TEMPERATURE PRODUCTS:

Handles asphalt, molten sulfur, paraffin, and similar materials while maintaining stable radar performance under extreme thermal conditions.



PROCESS VESSELS:

Suitable for reactors, pressured vessels, and mixing environments where turbulence, vapor, or obstructions require advanced FMCW measurement stability.

Benefits



Custody Accuracy:

Ensures ±0.5 mm custody-grade measurement that protects revenue, eliminates billing discrepancies, and supports audit-ready tank-farm reporting.



Enhanced Safety:

Non-contact IR calibration and ground-level access reduce climbing requirements, minimizing technician risk in hazardous tank-top environments.



Low Maintenance:

Dual processors, FMCW stability, and application-matched antennas reduce calibration drift and lower long-term maintenance and service needs.



Global Compliance:

UL, ATEX, IECEx, CE, and ABS approvals support safe worldwide operation and reduce risks of failed inspections or regulatory penalties.



Fast Integration:

Plug-in protocol emulation and flexible outputs support rapid retrofit projects, minimizing downtime and simplifying system modernization efforts.



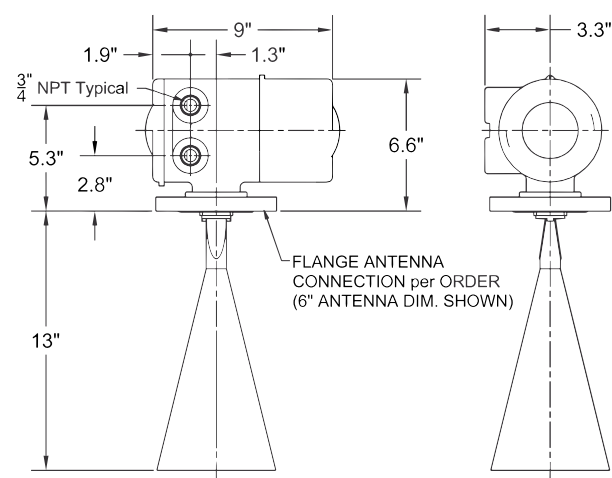
Operational Reliability:

High resolution with temperature compensation protects inventory accuracy by detecting shrinkage, evaporation, or leaks across varying conditions.

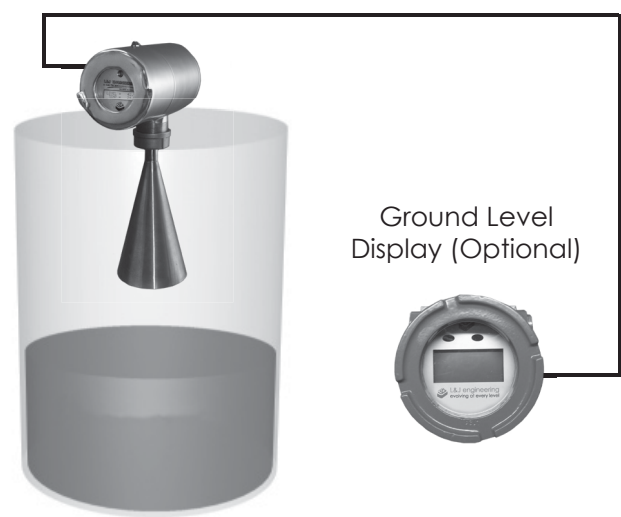
Technical Specifications & Key Features

Custody-Grade Accuracy:	±0.5 mm with 0.1 mm resolution for reliable billing and inventory control
Advanced FMCW Radar:	Dual processors for echo cancellation and self-calibration
Long Range Measurement:	0–75 ft standard, up to 180 ft optional
Safe, Easy Setup:	Smart Flash IR remote (no tank entry) and optional ground-level display
Temperature Compensation:	Integrates with MCG 300 RTD or 350/351 probes
Flexible Outputs:	4–20 mA, Tankway, Modbus, HART, WirelessHART
Wide Temperature & Pressure:	Electronics –40 °C to +65 °C; Product –100 °C to +250 °C; 150 PSIG standard, 300 PSIG optional
Global Certifications:	UL/C-UL, CE/ATEX, IECEx, ABS
Durable Construction:	Aluminum (~8 lb) or stainless steel
Versatile Mounting:	2" NPT or ANSI flange (150#/300#)

Dimensions



Typical System Layout



Model Number Selection

The model number will consist of a base number MCG 1600F followed by 10 digits.
These digits will represent 9 option tables:

AB • Material / Enclosure Type	
00	Aluminum
01	Stainless Steel Housing with AL waveguide

D • ANALOG OUTPUT	
0	None
1	Single 4-20mA Output
2	Dual 4-20mA Outputs
3	Single 4-20mA Input
4	Single 4-20mA Input, Single 4-20mA Output
5	Dual 4-20mA Inputs
6	Triple 4-20mA Inputs
7	Single 4-20mA Output (Isolated)
8	Dual 4-20mA Outputs (Isolated)
9	Single 0-20mA Output
A	Dual 4-20mA Input / Single 4-20mA Output

E • GROUND LEVEL DISPLAY	
0	No Ground Level Display Compatibility
1	Ground Level Display Compatibility (<75' 4-Wire)*
2	Ground Level Display w/ Extended Distance Compatibility* (>75' 6-Wire)

F • CONTACT OUTPUTS	
0	None
1	2 Dry Contacts
2	4 Dry Contacts
3	6 Dry Contacts

G • TEMPERATURE INPUTS	
2	No Temperature
2	Single Spot Temperature**
3	Double Spot Temperature**
4	Triple Spot Temperature**
6	Average Temperature***

* Requires MCG 1350M (ordered separately)
** Spot Temperature Ready. RTD Probe must be ordered separately.
*** Requires MCG 2350 Average Temperature Assembly and Average Temperature bulb (ordered separately).

C • ANALOG INPUT	
0	Level Only
1	Level and BS & W (from external source)
2	Level and Density (from external source)
3	Level, BS & W, and Density (from external source)

H • SIGNAL OUTPUTS	
0	None
1	L&J Tankway
2	GPE 31422, 31423
3	Varec (4-Wire)
4	Varec Matrix
5	Modbus on L&J Tankway
6	Modbus on RS 485 (2-Wire)
7	Modbus on RS 485 (4-Wire)
8	ENRAF
9	Fieldbus
A	Ti-Way
B	RS 232 Output
C	L&J Tankway on RS 485 (2-Wire)
D	L&J Tankway on RS 485 (4-Wire)
E	HART*
F	Saab TRL/2
G	Profibus DP
H	RGL / NMC
J	WirelessHART

* Requires at least (1) 4-20mA Output

I • APPROVALS	
0	UL/C-UL
1	UL/C-UL w/ SIL 2
2	ATEX
3	ATEX w/ SIL 2

J • POWER	
0	110 VAC
2	24-48 VDC (60 VDC Max), Non Isolated
3	48 VDC (70 VDC Max), Isolated
6	48 VAC
7	24 VAC
8	65 VAC
9	220 VAC

ADAPTER FLANGES		150#	300#
Size		SS - RF ANSI	SS - RF ANSI
		Part #	Part #
2"		160196	160199
3"		160214	160232
4"		160197	160233
6"		160198	160234
8"		160215	160235
10"		160216	160236
12"		160217	160237

ANTENNA OPTIONS*	
ATMOSPHERIC TANKS W/ FLAT OR CONE ROOF	
810891	3" Conical Horn Antenna Teflon Coated AL
810867	4" Conical Horn Antenna Teflon Coated AL
810670	6" Conical Horn Antenna Teflon Coated AL
810680	8" Conical Horn Antenna Teflon Coated AL
811149	3" Conical Horn Antenna 316SS
811151	4" Conical Horn Antenna 316SS
810672	6" Conical Horn Antenna 316SS
811150	8" Conical Horn Antenna 316SS
810671	15" Parabolic Antenna 316SS
811283	6" Hinged Hatch Mount Antenna (No Stilling Well)
811333	8" Hinged Hatch Mount Antenna (No Stilling Well)
ATMOSPHERIC TANKS W/ STILLING WELL	
811635	4" Conar Antenna Aluminum
811639	6" Conar Antenna Aluminum
811643	8" Conar Antenna Aluminum
811647	10" Conar Antenna Aluminum
811670	6" Hinged Hatch Mount Antenna
811674	8" Hinged Hatch Mount Antenna
PRESSURIZED TANKS W/ STILLING WELLS	
811145	4" Stilling Well Antenna 316 SS
810782	6" Stilling Well Antenna 316SS
810890	8" Stilling Well Antenna 316SS
810973	6" Stilling Well Antenna Teflon Coated AL
810783	8" Stilling Well Antenna Teflon Coated AL
810784	10" Stilling Well Antenna Teflon Coated AL
810785	12" Stilling Well Antenna Teflon Coated AL

*Unit comes standard 2" NPT mounting
Order appropriate adapter flange if required.

Summary

With over 100 years of tank measurement expertise, L&J delivers gauges operators can trust. The MCG 1600SFI combines advanced microwave FMCW radar performance with easy operation, safe calibration, and seamless system integration. Backed by global certifications and a legacy of supporting the world’s largest installed base of storage tanks, the 1600SFI protects your product, your people, and your bottom line — providing precision, reliability, and peace of mind in every measurement.

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