

MCG 1600SFI Smart Flash Infrared Radar Gauge

Dual Microprocessors

At the heart of the MCG 1600SFI is a high integration core microprocessor which can be customized to specific applications. A separate DSP microprocessor provides high speed measurement and algorithm processing for high accuracy, obstruction avoidance, self-calibration, and echo cancellation. All programmed and processed information can be displayed on the gauge's 32-character LCD as well as an optional ground level display.

Antennas

Years of experience have enabled L&J Engineering to provide the optimal antenna configuration for a given application. Four antenna designs, parabolic, cone, rod and stillwell, accommodate various process parameters which include surface conditions, height to measure, dielectric constant of product and internal obstructions.

Inventory Management

The MCG 1600SFI Radar Gauge, which transmit level and temperature data, can be remotely accessed by a computer/receiver such as the MCG 3900 via the L&J Tankway. Product temperature is obtained by using a MCG 300 3-wire R.T.D. (copper or platinum), or a MCG 350/351 averaging temperature probe with a MCG 2350 which is connected to an on-board analog-to-digital converter. It is no longer necessary to climb to the top of the tank to access the desired information or perform any of the programming functions. Simple plug-in interface modules emulate any existing, as well as custom field protocols or analog outputs. New or updated programs can be downloaded to any MCG 1600SFI into its on-board flash memory "on the fly" to incorporate communication protocol changes and additional functionality.

Ground Level Display

The optional Ground Level Display (MCG 1350) is a remote LCD display which is identical in form and function to the display on the main unit. It enables complete programming and calibration functions via the hand-held infrared calibrator, MCG 2150.



Features

- Frequency Modulated Continuous Waveform
- Crystal Controlled Phase Lock Loop Technology
- Ultra Highspeed Floating Point Digital Signal Processor for Continuous Calibration
- Density Measurement/Hybrid Gauge
- Antennas Tailored for Specific Applications

Applications

Liquid level gauging of virtually any corrosive, contaminated or viscous product including;

oil	chemicals	gasoline	polyethylene
tar	molten sulfur	phosgene	pharmaceuticals
latex	paraffin	titanium dioxide	cryogenic or liquefied gases
limestone rock	chocolate	molten aluminum	

Specifications

Measuring Principle:

FMCW Radar

Range:

0-75 feet (23m) standard.
Up to 180 feet (55m) optional

Accuracy:

+/- .5 mm

Resolution:

.1 mm

Radar Power Consumption:

Less than 1mw (0dBm)

Electronics Temperature:

-40° F to 150° F (-40°C to +65° C)

Product Temperature:

-148° F to 482° F (-100° C to 250° C)

Local Display:

2 line x16 Character LCD

Lightning Protection:

Comprehensive Surge
Protection Standard

Max. Pressure:

150PSIG (or 300PSIG optional)

Construction:

Aluminum
Stainless Steel

Mounting:

2" NPT Standard
Flanged Connection Available (See Ordering Guide)

Weight:

8 lbs. (Aluminum)

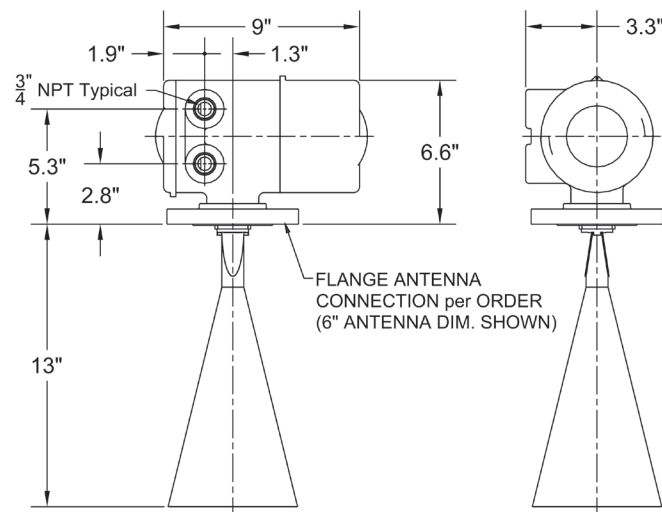
Safety Approvals:

Explosion Proof/ *Intrinsically Safe
Class I, Div. 1, Group B, C & D
UL/C-UL Approved
ABS Approved
CE/ATEX Approved II 1/2 G EEx d IIB T6, T5

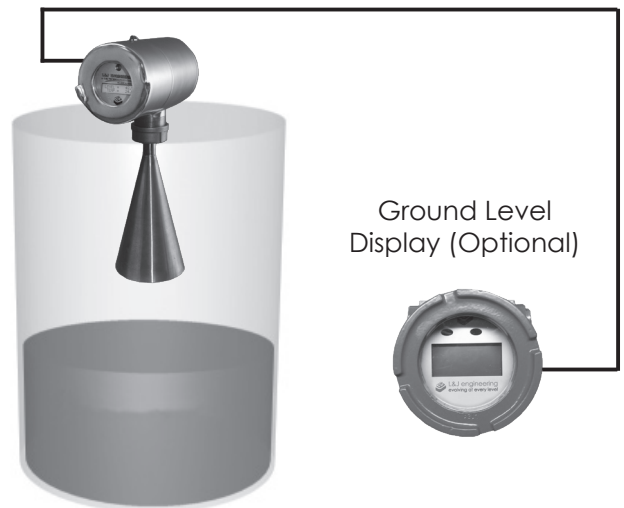
Antennas:

Parabolic, Cone, Stilling Well

Dimensions



Typical System Layout



All designs subject to change. Certified dimensions and specifications available upon request.

MCG 1600SFI Ordering Guide

MCG 1600SFI Smart Flash Infrared Radar Gauge

MCG 2150 Remote Calibrator
(One Required)

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:

MCG 1600F - AB - CD - EF - GH - IJ

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

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)

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	
0	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).



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

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

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

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.

