

## MCG 1500SFI Smart Flash Infrared Servo Gauge

### Brushless Design Eliminates Moving Parts

With only 3 moving parts (drum assembly, gear assembly, and stepper motor) and only two PC boards (the CPU and the strain gauge amplifier), L&J has minimized parts to ensure reliability. Brushless design eliminates the inherent problem of friction and wear on the contacts. The MCG 1500SFI is the most compact and lightest servo available today.

### Calibration Made Simple

The versatile MCG 1500SFI incorporates various self-calibration procedures to ensure absolute integrity as well as accuracy. Routines which are built into the processor have been designed to compensate for any possible product build-up on the displacer or any "give" or "play" in the cable.

### Engineered For High Performance

± 0.4mm accuracy provides the highest accuracy available in servo technology. The servo housing is divided into two sections, the drum chamber and the electronics chamber. The drum chamber is isolated from the electronics chamber by a magnetic coupling. The electronic chamber is a gas tight, explosion proof housing which isolates the electrical components from both the product environment and the atmosphere. The MCG 1500SFI typically communicates using the standard L&J Tankway 4-wire data highway, yet simple plug-in modules can be utilized to provide for emulation of most existing, as well as custom field protocols or analog outputs.

### Ground Level Display

The optional Ground Level Display (MCG 1350M) 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 I/R calibrator, MCG 2150.

### Inventory Management

The MCG 1500SFI, which transmits 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 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 highway interface modules emulate any existing, as well as custom field protocols or analog outputs. New or updated programs can be downloaded to any MCG 1500SFI into its on-board flash memory "on the fly" to incorporate communication protocol changes and additional functionality.



## Features

- $\leq \pm 0.4\text{mm}$  Accuracy
- Measure Product and Interface with Custody Transfer Accuracy
- Infrared Calibration
- Advanced Flash Memory Technology
- Ground Level Display Eliminates Tank Climbing
- Minimal Moving Parts (3) Ensure Reliability
- Monitor Field / Internal Parameters
- Measures Temperature, Pressure and Density

## Applications

- Density Measurement
- Product and BS&W Level Gauging in process industries
- Liquid Gas Propane (High Pressure Application)
- Custody Transfer

### Specifications

**Accuracy:**

≤ ± 0.4mm (± 0.016'')

**Resolution:**

0.4mm (0.016'')

**Sensitivity:**

± 0.1mm (± 0.004'')

**Measuring Range:**

0 - 75' (22m) (standard)  
0 - 150' (46m) (optional)

**Temp. Accuracy:**

0.5° F (.3° C)

**Temp. Resolution:**

0.1° F (.06° C)

**Density Accuracy:**

5 kg/m<sup>3</sup>

**Display:**

4-line x 20 character LCD

**Communication:**

L&J Tankway (standard available). Others available

**Baud Rate:**

300-9600 Selectable

**Field Wires:**

4 Field Wires (Tankway)  
(128 MCG Field Devices per L&J Data Highway)  
Static Power Consumption:  
200 mA at 110 VAC

**Lightning Protection:**

Comprehensive Surge Protection

**Control Option:**

Valve & Pump, Discrete Ins and Outs, Dry Contacts

**Operating Temperature:**

Drum Chamber:  
-40° F to 600° F (-40° C to 315° C)  
Elec. Chamber:  
-40° F to 185° F (-40° C to 85° C)

**Weight:**

AL-25 lbs, (11.37 kg)

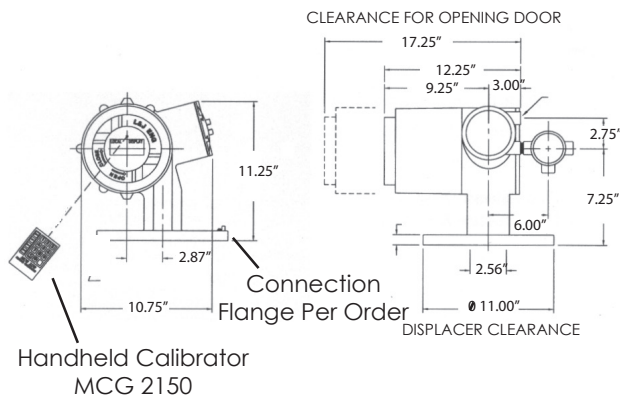
**Pressure:**

Atmospheric (25 psi), 150 psi optional, 300 psi optional

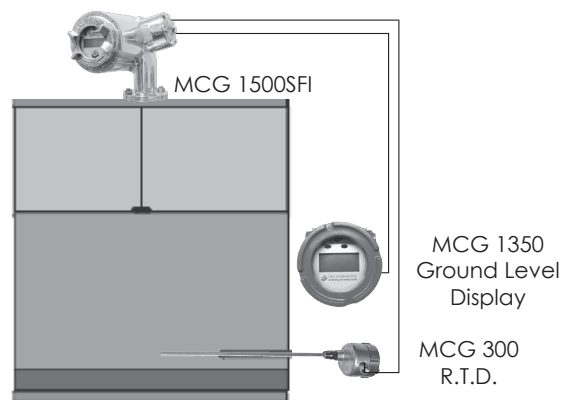
**Safety Approvals:**

UL/C-UL -Explosion Proof, Class I, Div.1 Group C&D,  
(Group B optional)  
CENELEC / ATEX II 1/2 G EEx d IIB T6

### Dimensions



### Typical System Layout



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

## MCG 1500SFI Ordering Guide

### MCG 1500SFI Smart Flash Infrared Servo Gauge

Includes: Explosion Proof Housing, Infrared Remote Capabilities, Smart Flash Technology, Local Graphical LCD Display

**MCG 2150 Remote Calibrator**  
 (One Required)

### Model Number Selection:

The model number will consist of a base number **MCG 1500F** followed by 10 digit letters. These digits will represent 6 option tables:

### MCG 1500F - AB - CD - EF - GH - IJ

AB – Housing/Flange	
02	150 #, ANSI 2" RF, S.S. Flange - 316 S.S. housing
03	300 #, ANSI 2" RF, S.S. Flange - 316 S.S. housing
05	150 #, ANSI 4" RF, S.S. Flange - 316 S.S. housing
06	300 #, ANSI 4" RF, S.S. Flange - 316 S.S. housing
08	150 #, ANSI 6" RF, S.S. Flange - 316 S.S. housing
09	300 #, ANSI 6" RF, S.S. Flange - 316 S.S. housing
10	150 #, ANSI 6" FF, Al. Flange - Aluminum housing
11	150 #, ANSI 2" FF, Al. Flange - Aluminum housing
12	150 #, ANSI 2" RF,C.S. Flange - Aluminum housing
13	150 #, ANSI 4" FF, Al. Flange - Aluminum housing
14	150 #, ANSI 4" RF,C.S. Flange - Aluminum housing
15	150 #, ANSI 4" FF,C.S. Flange - Aluminum housing
16	150 #, ANSI 6" RF,C.S. Flange - Aluminum housing
18	150 #, ANSI 8" RF,C.S. Flange - Aluminum housing
19	150 #, ANSI 10"RF,C.S Flange - Aluminum housing
22	150 #, ANSI 8" RF,S.S. Flange - 316 S.S. housing
23	300 #, ANSI 8" RF,S.S. Flange - 316 S.S. housing
24	150 #, ANSI 3" FF, Al. Flange - Aluminum housing
26	150 #, ANSI 8" FF, Al. Flange - Aluminum housing
28	150 #, ANSI 6" RF,C.S. Flange - 316 S.S. housing
29	300 #, ANSI 6" RF,C.S. Flange - 316 S.S. housing
30	150 #, ANSI 8" RF,C.S. Flange - 316 S.S. housing
31	300 #, ANSI 8" RF,C.S. Flange - 316 S.S. housing
32	150 #, ANSI 10" RF,S.S. Flange - 316 S.S. housing
33	300 #, ANSI 10" RF,S.S. Flange - 316 S.S. housing
43	300 #, ANSI 3" RF,S.S. Flange - 316 S.S. housing

AB – Housing/Flange (Continued)	
44	150 #, ANSI 3" RF,C.S. Flange - Aluminum housing
45	150 #, ANSI 3" RF,S.S. Flange - 316 S.S. housing
56	150 #, ANSI 6" RF,C.S. Flange - Al. Anodized housing
58	150 #, ANSI 8" RF,C.S. Flange - Al. Anodized housing

C – Density/BS&W	
0	Level Only
1	Level and BS&W
2	Level and Density (Single Point Calculation)
3	Level, BS&W, and Density
4	Site Specific (Modes)

D – Analog Input	
0	No Analog Input
1	Spot Temperature*
2	Average Temperature**
3	4-20mA Input, (Non-Isolated)
4	4-20mA Input, Spot Temperature*
5	4-20mA Input, Dual Spot Temperatures*
6	4-20mA Input, Average Temperature**
7	Dual 4-20mA Inputs, Average Temperature**
8	2 Additional Discrete Inputs
9	2 Additional Discrete Inputs, Spot Temperature**
A	4-20mA Input, 3 Spot Temperatures*

\* RTD Probe must be ordered separately.

\*\*Requires MCG 2350 Average Temperature

Assembly and Average Temperature bulb (ordered separately).

# MCG 1500SFI

## Smart Flash Infrared Servo Gauge



EF – Contact Outputs/Heater*	
00	None
01	2 Dry Contacts
02	4 Dry Contacts
03	6 Dry Contacts
20	Heater
21	Heater, 2 Dry Contacts
22	Heater, 4 Dry Contacts
23	Heater, 6 Dry Contacts

\*Units with Heater have no approvals

IJ – Power Supply	
08	110 VAC (50-60 Cycle)
09	24 VDC
10	48 VDC
12	220 VAC
13	48 VAC
14	24 VAC
30	220 VAC/ATEX/CENELEC
31	220 VAC/ATEX/CENELEC/W&M
48	65 VAC

GH – Signal Outputs	
01	None
02	L&J Tankway
03	4-20 mA Analog Out
04	L&J Tankway, Dual 4-20 mA, Level & Temperature
05	Dual 4-20 mA, Level & Temperature
06	GPE 31422, 31423
07	Varec 4-Wire
08	Varec Matrix
09	L&J Tankway, 4-20 mA Out
10	RS-232 Output
11	Modbus on RS-485 (2-Wire)
14	Modbus on RS-485 (4-Wire)
15	Modbus on RS-485 (2-Wire), 4-20mA Out
16	Modbus on L&J Tankway
18	Profibus DP
22	Enraf BiPhase Mark
23	Dual 4-20 mA Out, Level and BS & W
24	Dual 4-20 mA Out, Level and Density
25	HART
30	Modbus on L&J Tankway, 4-20mA Out
31	Ti-Way Interface
32	Dual 4-20mA, Whessoe Protocol
40	ENRAF Interface and 4-20mA Out
41	Allen Bradley TCP/IP Output
44	Saab TRL/2
45	Foundation Fieldbus
46	RGL
48	WirelessHART

**Other Items Available (Please Specify When Ordering):**

2 discrete inputs for park, BS & W (std.)  
 Additional inputs available.

**Notes: Information Required When Ordering:**

Specify English or Metric	Operating Pressure
Type of Product	Specific Gravity of Product
Specify Displacer Size*	Specify Displacer Material**
Ball Valve and Inspect. Chamber Required	Maximum Tank Pressure
Stilling Well & Size (if any)	Exact Tank Height

**Displacers\*\***

1.5" Displacer TFE # 810730	2" Displacer 316S.S. #810515
2" Displacer TFE # 810418	4" Displacer 316S.S. #810622
4" Displacer TFE # 810419	6" Displacer 316S.S. #810731
6" Displacer TFE # 810358	

\* Standard Displacer Size 6.0".

\*\* Standard Displacer Material: (Tefcofill) Carbon Filled Teflon (Other materials available).

**MCG 1500SFI Upgrade Kits**

These kits permit L&J Engineering customers to upgrade their servo technology to the new Smart Flash Infrared, or SFI technology. The upgrade kit varies depending upon the existing servo model as described below:

The following is for L&J Tankway, level, and Spot Temp. For any other configurations consult factory i.e. 4-20mA out. All upgrades will require an MCG 2150 to program the 1500SFI in the field. Prices listed below are for new boards only. See Bottom of page for trade-in pricing.

Part No.	Description
<b>811031</b>	<b>MCG 1500XL to MCG 1500SFI (Reuse Existing Dome)</b> This kit consists of a new MCG 1500SFI CPU PCB, scale board, and LCD Display. The upgrade from MCG 1500XL entails merely swapping out the old electronics with the new SFI electronics.
<b>811030</b>	<b>MCG 1500XL to MCG 1500SFI - w/ 2 RELAYS</b> This kit consists of a new MCG 1500SFI CPU PCB, scale board, and LCD Display. The upgrade from MCG 1500XL entails merely swapping out the old electronics with the new SFI electronics.