

# FloBoss™ 103 Flow Manager

The FloBoss™ 103 Flow Manager (FB103) measures, monitors, and can provide control of gas flow for a single meter run, typically using an orifice plate. This economical flow computer reliably and accurately performs gas flow calculations, data archival, and remote communications.

The FB103 has an explosion proof, weather-tight enclosure, with an optional window and LCD display. This self-contained flow computer has a processor circuit board, internal batteries, a termination board, an integral Dual Variable Sensor (DVS), terminal wiring for a 2 or 3-wire RTD, optional I/O points, and an optional communication card.

The FB103 unit consists of the following components and features:

- A 32-bit main microprocessor, with 128 KB of flash boot ROM, 2 MB for flash ROM, and 512 KB of RAM data storage.
- Dual-Variable Sensor (DVS) for static pressure and differential pressure measurement.
- Support for a 100-Ω platinum RTD.
- Weather-tight enclosure.
- Local Operator Interface port (LOI).
- EIA-485 (RS-485) Communications Port.

## Firmware

The firmware provides the following functionality. For more information about the firmware, refer to *Product Data Sheet FB100:FW1*.

- 1992 AGA3 flow calculations (with user-selectable AGA8 compressibility: Detail, Gross I, or Gross II) for a single orifice meter run.
- 1996 AGA7 flow calculations (with user-selectable AGA8 compressibility) for a single turbine meter.
- Memory logging of 240 alarms and 240 events.
- Standard History Archival of 35 days hourly values, 60 minute values, and min/max data for up to 35 points.
- Extended History Archival for up to 15 points at a configurable interval.
- Radio power control.
- Closed-loop Proportional, Integral, and Derivative (PID) control capabilities.
- Logic and sequencing control using two user-defined Function Sequence Table (FST) programs.

- Alarm call-out to a host, known as Spontaneous Report By Exception (SRBX).
- ROC and Modbus protocol support.
- User C programs support for alternate measurement standards and specialty applications. Contact your local sales representative for available programs.
- Pass-Through communications on multiple ports.

The FB103 unit can perform gas flow calculations to GOST standards and ISO 5167 standards, using factory supplied programs. Contact your sales representative for more information.

The FB103 maintains API Chapter 21.1 compliant historical archives.

## Configuration Software

The field I/O, DVS inputs, flow calculation, history logging, and all other functions are accessed and configured using ROCLINK™ 800 Configuration Software (see *Product Data Sheet RL800*).



W8672

*FloBoss 103 Flow Manager (shown with optional solar panel)*

## Termination Board

The termination board provides terminations for the RTD input, the LOI communications port, the EIA-485 (RS-485) communications port (COM1), an optional communications card (COM2), and a power supply.

The Local Operator Interface (LOI) port provides a direct, local link between the FloBoss unit and a personal computer (PC). A PC on the LOI port running ROCLINK 800 software can configure the functionality of the FloBoss unit and monitor its operation. In addition, a host computer can remotely configure the FloBoss unit through the host communications port (COM2).

## Diagnostics

Three diagnostic inputs are dedicated to monitoring internal voltage, battery voltage, charge input voltage, and enclosure temperature.

## Dual-Variable Sensor

The DVS uses the proven Rosemount capacitance cell technology to sense differential pressure. It also uses piezoresistive, silicon sensor technology to sense static pressure and provide extremely accurate, stable and repeatable readings. A dedicated microprocessor in the DVS linearizes and corrects the raw sensor signals using characterization data stored in non-volatile memory.

The DVS consists of a Rosemount-designed Coplanar flange, which provides drain/vent valves and process connections. The DVS is factory-attached to the FloBoss 103 enclosure using a flanged coupler. For more information, refer to *Technical Specification DVS205*.

## Housing

The IP66 enclosure has explosion proof / flame proof approvals and protects the electronics from physical damage and harsh environments using this housing. The FB103 has a Class I, Division 1 / Zone 1 rating when properly installed with conduit seals and a plug in the top of the housing.

The FB103 has two available housing construction materials. You can choose aluminum or SST (stainless steel).

The caps at either end of the enclosure can be unscrewed to allow field maintenance. The enclosure has two ¾-inch pipe threaded holes for field wiring, communications or panel access.

## Mounting

The FB103 assembly has bracket holes that allow the FB103 to be mounted on a pipestand or mounting bracket.

## Options

**Liquid Crystal Display (LCD)** – Through the optional LCD display, you can view selected data stored in the FB103. The LCD is typically used to display flow data, time and date, real-time parameters and user-specified parameters. The LCD displays two lines: the top line has 8 numeric characters and the bottom line has 5 alpha-numeric characters. The display scrolls through the configured list of items, when activated by the user.

**6 Points of Expansion I/O** – The termination board provides terminations for six optional I/O points. The six points of I/O consists of one Discrete Output (non-selectable), two Analog Inputs/Discrete Inputs (software-selectable), one Analog Output/Discrete Output (switch-selectable), and two Pulse Inputs/ Discrete Inputs (software-selectable). Refer to *Specification Sheet 5.3:IO6*.

Five of the six points of I/O are selectable. You can switch the analog output to a discrete output, analog inputs to discrete inputs, and pulse inputs to discrete inputs using the I/O Setup screen in ROCLINK™ 800 Configuration Software and the AO/DO switch.

**Dial-up Modem Card, EIA-232 (RS-232), and EIA-485 (RS-485) Serial Communications Cards** – Optional communications cards (installed on COM2 port) provide the ability to send and receive data remotely via either a dial-up modem card, EIA-232 (RS-232) serial communications card, or an EIA-485 (RS-485) serial communications card.

**Blank Plate** – An optional blank plate that fits on the bottom of the FB103 unit is available when no DVS sensor is required. The blank plate allows mounting to a pipestand.

**Solar Panel Mast Assembly** - Optional solar panels with mast and mounting hardware provide either 2 or 5 watts of power for the FB103. As shown on page 1, the solar panel mast assembly mounts to the top of the FB103 enclosure. See the approvals section for installation.

**Internal Batteries** – The optional internal, rechargeable, lead-acid batteries provide 6.2 volts dc to the FB103 unit. The batteries are re-chargeable by means of the charger board. See the approvals section for installation.

**Warning:** Connecting the FB103 to a continuous power source without removing the battery charger module may result in battery overcharging and failure. See Section 3.5.1, Overcharging Potential in the FloBoss 103 and 104 Flow Manager Instruction Manual (part D301153X012).

## Accessories

Accessories available for the FB103 include a pipe mounting bracket and a Local Operator Interface cable (required for local configuration). Contact your local sales representative for more information.

## FloBoss™ 103 Flow Manager

CPU Module		
Processor	32 bit, running at 3.68 MHz	
Memory	Program	2 MB flash EPROM (programmable) for firmware and configuration
	Data	512 KB SRAM
	Boot	128 KB Flash EPROM
Clock	Real Time. Year/Month/Day and Hour/Minute/ Second. Battery Backed. ±5 second/year accuracy	
Diagnostics	These conditions are monitored and alarmed: Pulse Interface Module and RTD point fail; battery, charger and internal voltages; internal temperature.	
Communications		
Ports on CPU module	LOI (Local Operator Interface)	EIA-232 (RS-232C), Software configurable, 1200 to 19,200 bps rate selectable
	COM1	EIA-485 (RS-485), software configurable, 1200 to 19,200 bps rate selectable
	COM2 (Host)	EIA-232 (RS-232), EIA-485 (RS-485), or 2400 baud Dial-up Modem. EIA-232, EIA-485, or Modem requires optional communications card.
Protocols	ROC or Modbus Slave or optional Modbus Host (ASCII or RTU) on all ports	
Inputs/Outputs		
RTD Input	Quantity	1
	Type	2 or 3-wire RTD element with alpha of 0.00385.
	Terminals	“RTD+” current source, “RTD+” signal positive input, and “RTD RET” signal negative input
	Sensing Range <sup>1</sup>	-40 to +240°C (-40 to +464°F) (default)
	Accuracy <sup>1</sup>	±0.2°C (0.64°F) over sensing range (includes linearity, hysteresis, repeatability)
	<p>1. The accuracy depends on the span calibrated for the sensing range of the RTD Input. The sensing range is the difference between the calibrated zero and calibrated span. The sensing range may be changed from the defaults during calibration. When the sensing range is less than or equal to 300°C, the accuracy is 0.2°C. When the sensing range is greater than 300°C, the accuracy is 0.5°C. Sensing range limits are -40 to +800°C.</p>	
	Ambient Temperature Effects per 28°C (50°F)	±0.50°C (0.90°F) for process temperatures from -40 to +240°C (-40 to +464°F)
	Filter	Band-pass hardware filter
	Resolution	15 bits
	Sample Period	1 second minimum
Power		
Internal Batteries	Lead-acid. Rechargeable. Nominal 6.2 V dc, 2.5 amp-hour. Battery life with no charging input and no communications: 3 weeks.	
External Power Charging Input	8-28 V dc. Reverse Polarity Protection.	

Input Power	10-15 mA nominal. 20 mA at 100% duty cycle (battery charging not included)	
Solar Panel (optional)	2 Watts Output	9 V nominal
		Size 114 mm by 159 mm (4.5 in. by 6.25 in.)
	5 Watts Output	9 V nominal
		Size 222 mm by 229 mm (8.75 in. by 9 in.)
<b>Physical</b>		
Dimensions	160 mm H by 148 mm W by 216 mm D (6.3 in H by 5.8 in W by 8.5 in D), excludes mounting flange and interface. Depth, D, is end cap to end cap dimension.	
Mounting	Mounts on a 2-inch pipe with U-bolt mounting kit (optional).	
Weight	Aluminum housing	6.58 kg (14.5 lbs)
	SST (Stainless steel) housing	12.1 kg (26.7 lbs.)
Enclosure	Housing and Cap	Die-cast aluminum alloy with iridite plating and paint. An optional cast stainless steel (CF8M) version is available.
<b>Environmental</b>		
Operating Temperature	-40 to +75°C (-40 to +167°F)	
	LCD Display	-20 to +75°C (-4 to +167°F)
Storage Temperature	-50 to +85°C (-58 to +185°F)	
Operating Humidity	5 to 95% non-condensing	
Radiated/Conducted Transmissions	Meets requirements of IEC 61326 Electrical Equipment for Measurement, Control and Laboratory Use, Industrial locations	
Radiated Emissions	Meets FCC Part 15, Class A	
Vibration	Meets SAMA PMC 31.1	

## Approvals

Product Markings for Hazardous Locations

CSA C-US

Certified by CSA

Model W40106  
Class I Division 1, Groups C & D  
Explosion-proof  
Type 4 enclosure

Model W40106  
Class I, Division 2, Groups A, B, C, & D  
Temperature Code T3  
Non-incendive  
Type 4 enclosure

Model W40112  
Class 1, Division 2, Groups A,B,C, & D  
Temperature Code T3  
Non-incendive  
( $T_{amb} = 75^{\circ}\text{C}$ )  
Type 4 enclosure



Evaluated per Approval Standards

CAN/CSA-C22.2 No. 0-M91  
CAN/CSA-C22.2 No. 94-M91  
CSA-C22.2 No. 30-M1986  
CSA-C22.2 No. 142-M1987  
CSA-C22.2 No. 213-M1987  
UL No 50 (11<sup>th</sup> Edition)  
UL No. 1203 (4<sup>th</sup> Edition)  
UL No. 1604 (3<sup>rd</sup> Edition)  
ANSI/UL No 508 (16<sup>th</sup> Edition)  
ANSI/ISA No. 12.12.01-2007  
ISA No. 12.27.01-2003

ATEX

Certified by LCIE

Model W40116  
Cert LCIE 03 ATEX 6221 X X/05  
EX II 2 G  
Ex d IIB T5 Gb ( $T_{amb} = 75^{\circ}\text{C}$ )  
Type d or Flameproof (Zone 1)  
IP66 enclosure

Model W40116  
Cert LCIE 13 ATEX 1033 X  
EX II 3 G  
Ex nA IIC T3 Gc ( $T_{amb} = 75^{\circ}\text{C}$ )  
Type n (Zone 2)  
IP66 enclosure



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Evaluated per Approval Standards EN60079-0:2012(Flameproof)  
 EN60079-1:2007(Flameproof)  
 EN60079-15:2010(Type N)  
 EN60079-0:2012(Type N)  
 IEC 60529

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IECEX

Certified by IECEX

Model W40149  
 Cert IECEX LCI 08.0039X  
 Ex d IIB T5 Gb ( $T_{amb} = 75^{\circ}C$ )  
 Type d or Flameproof (Zone 1)  
 IP66 enclosure

Model W40149  
 Cert IECEX LCI 08.0015  
 Ex nA IIC T3 Gc ( $T_{amb} = 75^{\circ}C$ )  
 Type n (Zone 2)  
 IP66 enclosure

Model W40150  
 Cert IECEX LCI 08.0015  
 Ex nA IIC T3 Gc ( $T_{amb} = 75^{\circ}C$ )  
 Type n (Zone 2)  
 IP66 enclosure

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Evaluated per Approval Standards IEC 60079-0:2011 Edition 6.0  
 IEC 60079-1: 2007 Edition 6.0  
 IEC 60079-15:2010 Edition 4  
 IEC 60529

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Miscellaneous Approvals

RoHS (China)



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**Global Headquarters,  
North America, and Latin America:**

Emerson Process Management  
Remote Automation Solutions  
6005 Rogerdale Road  
Houston, TX 77072 U.S.A.  
T +1 281 879 2699 | F +1 281 988 4445  
[www.EmersonProcess.com/Remote](http://www.EmersonProcess.com/Remote)

**Europe:**

Emerson Process Management  
Remote Automation Solutions  
Unit 8, Waterfront Business Park  
Dudley Road, Brierley Hill  
Dudley UK DY5 1LX  
T +44 1384 487200 | F +44 1384 487258

**Middle East/Africa:**

Emerson Process Management  
Remote Automation Solutions  
Emerson FZE  
P.O. Box 17033  
Jebel Ali Free Zone – South 2  
Dubai U.A.E.  
T +971 4 8118100 | F +971 4 8865465

**Asia-Pacific:**

Emerson Process Management  
Remote Automation Solutions  
1 Pandan Crescent  
Singapore 128461  
T +65 6777 8211 | F +65 6777 0947

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