

# FloBoss™ 103 Flow Manager (ATEX and IECEx Versions)

The FloBoss™ 103 Flow Manager 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. One ATEX version and two IECEx versions of the FloBoss 103 are available for use in EU countries.

## ATEX and IECEx Flame-proof

The ATEX and IECEx Flame-proof approved versions have a flame-proof, weather-tight enclosure, with an optional window and LCD display. This self-contained flow computer has a processor circuit board, 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.

## IECEx Type N

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



W8674

*FloBoss 103 Flow Manager*

The FloBoss 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 ohm, platinum RTD.
- Weather-tight enclosure.
- Local Operator Interface port (LOI).
- EIA-485 (RS-485) Communications Port.

The FloBoss 103 utilizes a 32-bit microprocessor, which takes advantage of multiple low-power operating modes. The FloBoss 103 comes standard with 512 KB of built-in Random Access Memory (RAM) for storing data and history. Backup power for the RAM is supplied by a small lithium battery. The FloBoss unit also has 2 MB of programmable Read-Only Memory (flash ROM) for storing operating system firmware, configuration parameters, and applications firmware.

## Firmware

The firmware provides the following functionality.

- 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.

# Specification Sheet

The FloBoss 103 unit can perform gas flow calculations to GOST standards and ISO 5167 standards, using user C programs. Contact your sales representative for more information.

The FloBoss 103 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 *Specification Sheet 4:RL800*).

## 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 bottom 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 *Specification Sheet 2.5:DVS205*.

## Housing

The flame-proof, IP66 enclosure protects the electronics from physical damage and harsh environments. The enclosure has a Class I Zone 1 (flame-proof) rating when properly installed with conduit seals and a plug in the top of the housing.

After loosening the cover clamp, 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 FloBoss 103 assembly has bracket holes that allow the FloBoss 103 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 FloBoss unit. 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. Five of the six points of I/O are selectable. 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 FloBoss 103 unit is available when no DVS sensor is required. The blank plate provides mounting to a pipestand.

(Continued on Page 4)

**Specifications**

**PROCESSOR INFORMATION**

32 bit, running at 3.68 MHz.  
**Program Memory:** 2MB flash EPROM (programmable) for firmware and configuration.  
**Data Memory:** 512 KB SRAM.  
**Boot Memory:** 128 KB Flash EPROM.

**TIME FUNCTIONS**

**Clock:** Real Time. Year/Month/Day and Hour/Minute/Second. Battery Backed.  
**Clock Accuracy:** ± 5 seconds/year.

**DIAGNOSTICS**

These conditions are monitored and alarmed: sensor and RTD point fail, internal voltages, internal temperature.

**COMMUNICATIONS**

**Local Operator Interface (LOI):** EIA-232 (RS-232C) format. Software configured, 1200 to 19,200 bps rate selectable.  
**EIA-485 (RS-485) (COM1):** Software configured, 1200 to 19,200 bps rate selectable.  
**Host (COM2):** EIA-232 (RS-232), EIA-485 (RS-485), or Modem interface when optional communications card is installed.  
**Protocols:** ROC or Modbus Slave or optional Modbus Host (ASCII or RTU) on all communication ports.

**POWER**

**External Power Charging Input:** 8-28 V dc.  
**Input Current:** 5 mA nominal. 9.5 mA at 100% duty cycle.

**SOLAR PANEL** (optional)

**5 Watts Output:** 9 V nominal. Size: 222 mm by 229 mm (8.75 in. by 9 in.).

**ENCLOSURE**

**Housing and Cap:** Die-cast aluminum alloy with iridite plating and paint. Investment cast stainless steel (CF8M) version available.

**RTD INPUT**

**Quantity/Type:** Single input for a 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 (default).  
**Accuracy<sup>1</sup>:** ±0.2°C over the default sensing range (includes linearity, hysteresis, repeatability).  
**Ambient Temperature Effects per 28°C:** ±0.50°C for process temperatures from -40 to 240°C.  
**Filter:** Band-pass hardware filter.  
**Resolution:** 15 bits.  
**Sample Period:** 1 sec minimum.

**WEIGHT**

6.58 kg (aluminum); 12.1 kg (SST).

**DUAL-VARIABLE SENSOR (DVS)**

Refer to *Specification Sheet 2.5:DVS205*.

**ENVIRONMENTAL**

**Operating Ambient Temperature:** -40 to 75°C.  
**LCD Display:** -20 to 75°C.  
**Storage Temperature:** -50 to 85°C.  
**Operating Humidity:** 5 to 95%, non-condensing.  
**Vibration:** Meets SAMA PMC 31.1.  
**Radiated/Conducted Transmissions:** Meets requirements of IEC 61326 Electrical Equipment for Measurement, Control and Laboratory Use, Industrial Locations.  
**Radiated Emissions:** FCC Part 15, Class A.  
**Classification:** CISPR 22 and FCC Class A computing device.

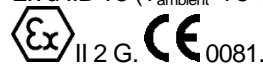
**DIMENSIONS**

**Enclosure:** 160 mm H by 148 mm W by 216 mm D excludes mounting flange and sensor. Depth is farthest edge of end cap to farthest edge of other end cap.  
**Pipestand Mounting:** Mounts on a 2-inch pipe with U-bolt mounting kit (optional).

**APPROVALS:**

**ATEX Version**

Evaluated per the following standards:  
 EN 60079-0 (2004)  
 EN 60079-1 (2004)  
 IEC 60529 (2001)  
 Certified by LCIE as Model W40116.  
 Ex d IIB T5 (T<sub>ambient</sub>=75°C), IP66.



**IECEx Version (Flame-proof and Type N)**

Evaluated per the following standards:  
 IEC 60079-0 (2000) Edition 3.1  
 IEC 60079-1 (2003), 5<sup>th</sup> Edition  
 IEC 60079-15 (1987)  
 IEC 60079-15 (2001), 2<sup>nd</sup> Edition  
 IEC 60529 (2001)  
 Certified by CSA as Model W40149.  
 Ex d IIB T5 (T<sub>ambient</sub>=75°C)  
 Ex nAL IIC T3 (T<sub>ambient</sub>=75°C), IP66.

**IECEx Version (Type N Only)**

Evaluated per the following standards:  
 IEC 60079-15 (1987)  
 IEC 60079-15 (2001), 2<sup>nd</sup> Edition  
 IEC 60529 (2001)  
 Certified by CSA as Model W40150.  
 Ex nAL IIC T3 (T<sub>ambient</sub>=75°C), IP66.

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.

(Continued from Page 2)

## Options (IECEx Type N version only)

**Logic/Radio Interface** - An optional logic card (installed on COM2) and radio interface module provides the ability to send and receive data remotely via spread spectrum, wireless radio. The radio interface mounts inside the FloBoss enclosure. The user-supplied antenna is mounted externally (see *Specification Sheet 5.3:RIB*).

**Solar Panel Mast Assembly** - Optional solar panel with mast and mounting hardware provide 5 watts of power for the FloBoss 103. The solar panel mast assembly mounts to the top of the FloBoss enclosure.

**Internal Batteries** – The optional internal, rechargeable, lead-acid batteries provide 6.2 volts dc to the FloBoss 103 unit. The batteries are rechargeable by means of the charger board.

## Accessories

Accessories available for the FloBoss 103 include a pipe mounting bracket and a Local Operator Interface cable (required for local configuration). Contact your local sales representative for more information.

Bristol, Inc., Bristol Canada, BBI SA de CV and Emerson Process Management Ltd, Remote Automation Solutions division (UK), are wholly owned subsidiaries of Emerson Electric Co. doing business as Remote Automation Solutions ("RAS"), a division of Emerson Process Management. FloBoss, ROCLINK, Bristol, Bristol Babcock, ControlWave, TeleFlow and Helicoid are trademarks of RAS. AMS, PlantWeb and the PlantWeb logo are marks of Emerson Electric Co. The Emerson logo is a trademark and service mark of the Emerson Electric Co. All other marks are property of their respective owners.

The contents of this publication are presented for informational purposes only. While every effort has been made to ensure informational accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. RAS reserves the right to modify or improve the designs or specifications of such products at any time without notice. All sales are governed by RAS' terms and conditions which are available upon request. RAS does not assume responsibility for the selection, use or maintenance of any product. Responsibility for proper selection, use and maintenance of any RAS product remains solely with the purchaser and end-user.

### Emerson Process Management

#### Remote Automation Solutions

Marshalltown, IA 50158 U.S.A.

Houston, TX 77041 U.S.A.

Pickering, North Yorkshire UK Y018 7JA

