



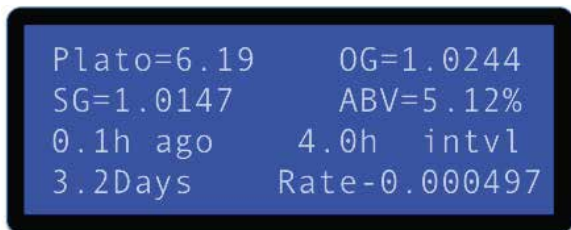
# Automated Fermentation Monitor (AFM)

## Do You Know Your Beer Fermentation?

Craft brewers have a common challenge to consistently produce a high quality beer, at a reasonable cost using available equipment and labor. Maintaining batch-to-batch consistency requires data. Frequent monitoring of the fermentation progress is difficult to achieve with available labor and equipment.

## Our Solution, BeerSense™ AFM

Integrated Sensing Systems, Inc. (ISS) is proud to introduce the revolutionary BeerSense™ Automated Fermentation Monitoring (AFM) system for brewers of all sizes. The AFM is a quality enhancing and labor-reducing alternative to the routine measurement of beer using a glass hydrometer or a handheld density meter. The AFM provides time stamped measurements of beer density during the fermentation process. Sampling frequency is set by the user. Operating unattended 24 hours a day, it generates measurements at critical times in the process. This data is used to identify problems with a fermentation and when to stop the batch.



LCD displays °Plato, Specific Gravity, ABV, time since last sample, total time and fermentation rate reduction per hour

## Bubble Resistant Beer Sampling

Automated, on-fermenter sampling of beer has been a challenge due to the entrained carbon dioxide gas and produced foam. The patent pending AFM sampling system withdraws beer from the fermenter on a timed basis. Foam is separated and the beer is pumped through an embedded micro density sensor for measurement of °Plato and specific gravity.

## AFM Benefits

- Highly repeatable beer production by measuring and tracking fermentation with the historical signature of each beer type
- Reduce labor to monitor fermentation
- Real-time indication of fermentation completion
- Improved density measurement reliability
- Accurate SG, °Plato and ABV measurements
- Operates without degassing
- Early detection of potential fermentation problems
- Easy to install
- Vibration insensitive
- CIP compatible



## AFM Specifications

### Measurements

°Plato: +/- 0.1  
 Specific Gravity: 0.0001  
 Density Resolution: 0.0001g/cc

### Electrical, Digital Communication

Power: 24vDC (2 watts, 12 watts with tablet)  
 Digital: RS232

### Sampling Frequency

Programmable by users (0.1-12 hours)

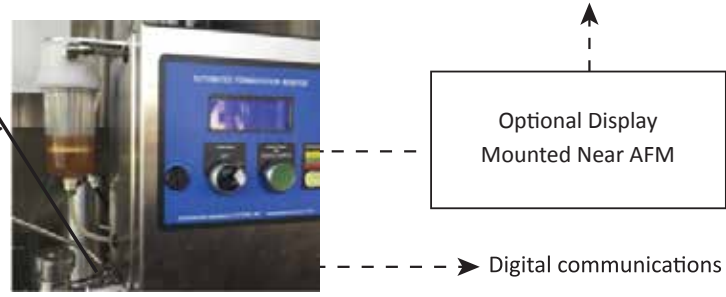
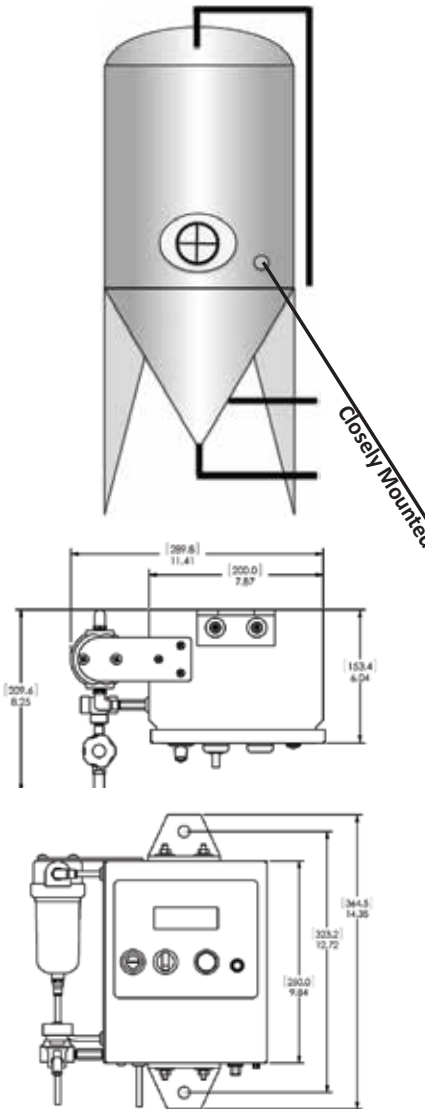
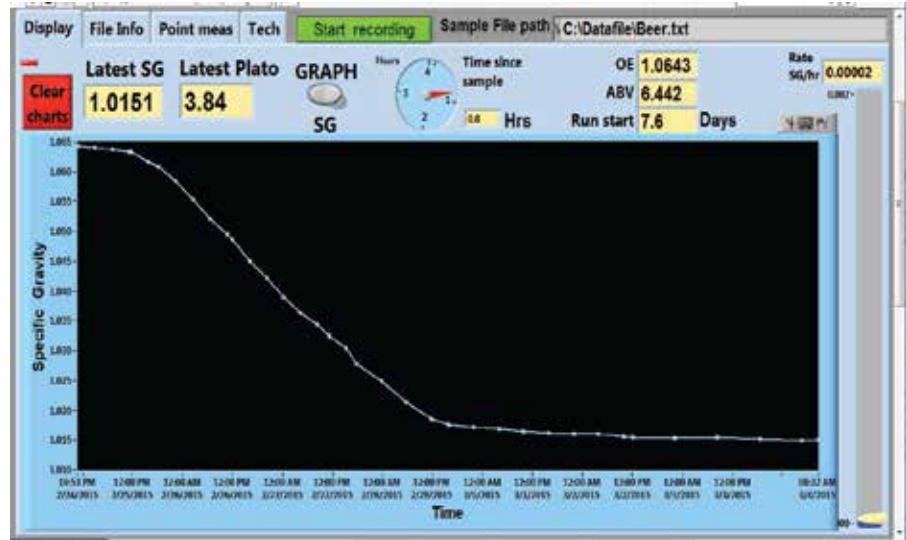
### Physical Specifications

Weight: 10.5 lbs  
 Size: 11" x 10" x 6"  
 Mounting: Unistrut, close to sample point  
 IP 65

# MicroCoriolis™ Digital Density Measurement Technology

BeerSense™ is powered by Integrated Sensing Systems (ISS), a proven leader with over 20 years of experience with MEMS vibrating silicon technology. The heart of the BeerSense™ family of products is an innovative, liquid digital density measurement technology, the ISS patented\* microCoriolis™ sensor. The components of a vibrating tube digital density meter are miniaturized using silicon micromachining technology to fabricate this sensor. An integrated platinum RTD temperature sensor is closely coupled to the silicon micro-tube density sensor for precise fluid temperature. The combination of density and temperature measurement, sophisticated electronics and software, result in a sensor that can convert these measurements into data useful in beer production. The small size of the microCoriolis™ sensor results in a natural resistance to dissolved gas in the beer. Yeast easily passes through the filter and density sensor. The result, consistent measurements from start to finish.

## Plot of Specific Gravity During Fermentation



## Simple, On-Fermenter Installation

The BeerSense™ AFM is a completely self contained unit that is mounted on or close to the fermentation vessel and plumbed to the existing sample port. The device is powered with 24vDC for operation in wet environments. The AFM periodically removes a sample of beer from the fermenter and measures °Plato and specific gravity. Waste beer is collected in a container. The complete system can be cleaned by CIP systems for sterile operation. The results are summarized on an integral LCD display. An optional display, running custom ISS software, provides a graph of fermentation progress. Digital data is available as an output to other computers. The results of the complete fermentation run are stored in the computer in a format compatible with spreadsheet programs.

\* US Patents 6,477,901, 6,499,354, 6,637,257, 6,647,778, 6,923,625, 6,932,114, 6,935,010, 7,059,176, 7,228,735, 7,263,882, 7,351,603, 7,381,628, 7,437,912, 7,568,399, 7,581,429, 7,628,082, 7,789,949, 7,823,445, 7,921,737B2, 8,016,798, 8,021,961, Japanese Patent 4,568,763 and more patents pending

## Integrated Sensing Systems, Inc.

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