



Digital Brewing - Touch-Free Hydrometry

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BAM Tech Talk
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Tracking Beer Fermentation

How do we know that beer is fermenting?

Measure wort/beer density!

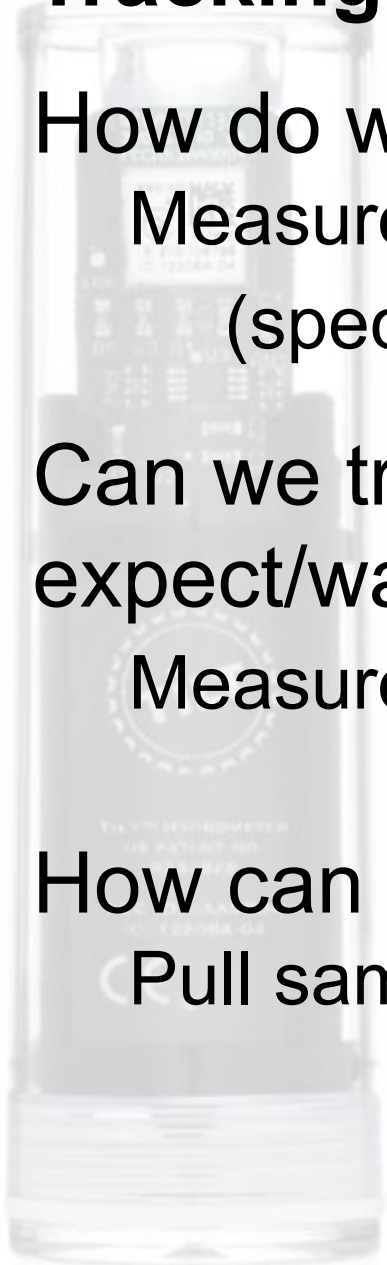
(specific gravity, degrees plato, brix)

Can we trust that the beer is fermenting as we expect/want?

Measure regularly

How can we track it at regular intervals?

Pull samples and measure...?





Regular Fermentation Tracking

Option 1: Regular hydrometer measurement:

Pros	Cons
Accurate gravity reading	Possible contamination
	6-8 oz per sample, uses much beer

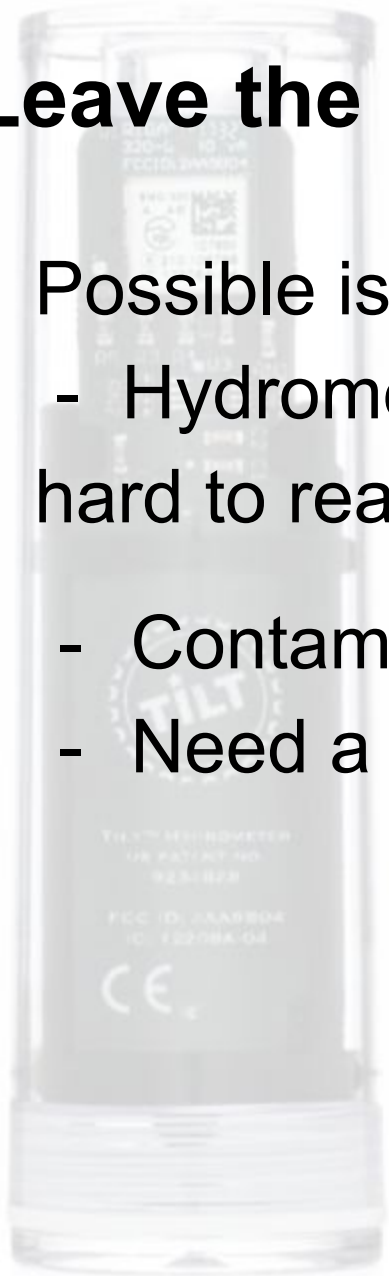
Option 2: Regular refractometer measurement

Pros	Cons
Need just a few drops	Possible contamination
	Have to convert reading to “actual”

Leave the hydrometer in the fermenting beer?

Possible issues:

- Hydrometer covered in krausen, reads wrong or hard to read
- Contamination and Oxidation
- Need a clear vessel (glass) to read



Go Touch-Free with Digital Hydrometry!

Allows regular gravity measurement without touching the fermenting wort for every measurement

3 on the market discussed here:

Beer Bug: Sits atop vessel, hangs bob in wort

TILT: Immersed in liquid, “floats” in wort/beer

Plaato Digital Airlock: sits atop vessel like a traditional 3-piece

[There](#) are [others](#), but the tech is similar to those above.

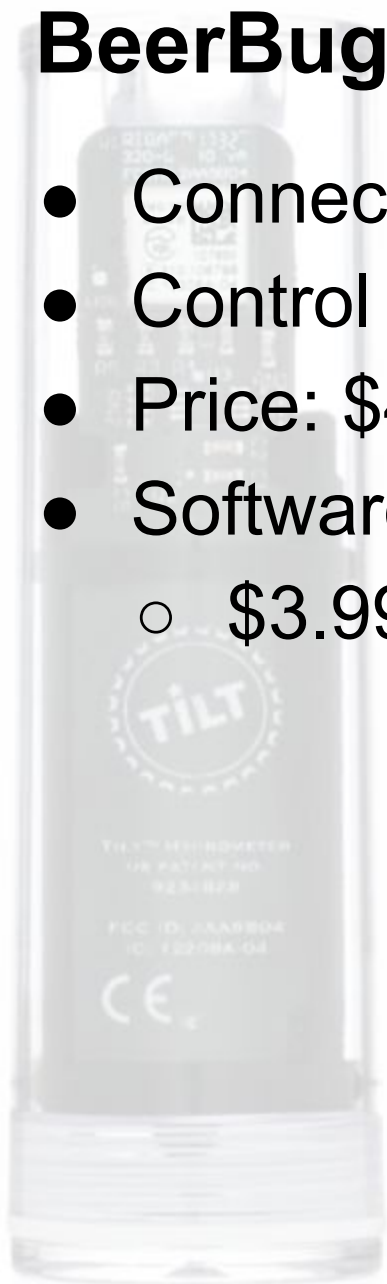
BeerBug Basics

- Acrylic “torpedo” suspended from airlock opening
- Head unit sits atop fermenter
- Torpedo buoyancy changes with gravity
- Temperature reading “ambient



BeerBug Connectivity and Cost

- Connects to BrewPerfect servers over wifi
- Control via app
- Price: \$40-\$60?
- Software Licensing (includes hardware)
 - \$3.99/mo or \$159 lifetime

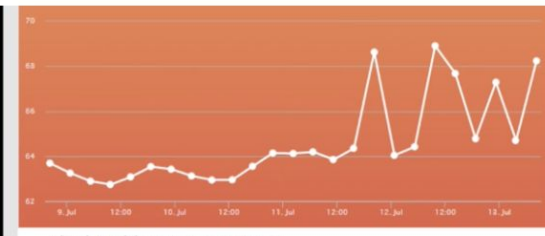


Final Gravity
1.011

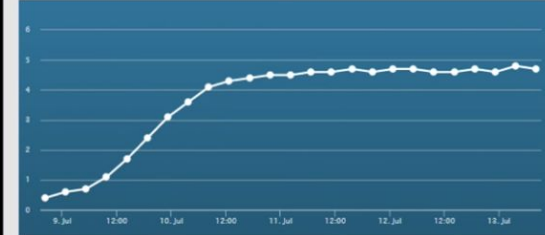
OG: 1.047
EFG: 1.010



Final Ambient Temperature
68.2F



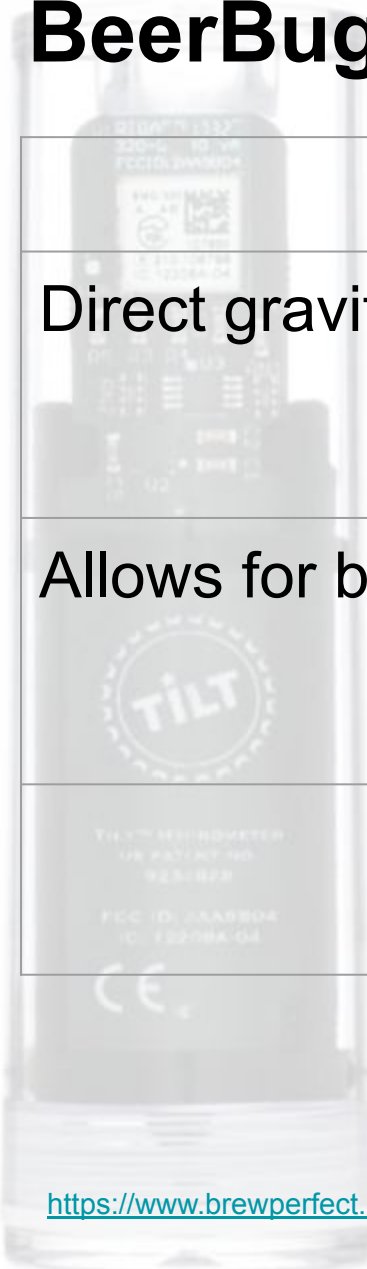
Final Ambient Temperature
68.2F



Final Alcohol %
4.7%

EABV: 4.7%

BeerBug Pros and Cons



Pros	Cons
Direct gravity measurement	One-time or monthly subscription to proprietary software
Allows for blow-off	Krausen may cake on torpedo, obscure measurement
	Anecdotaly: Must calibrate every use

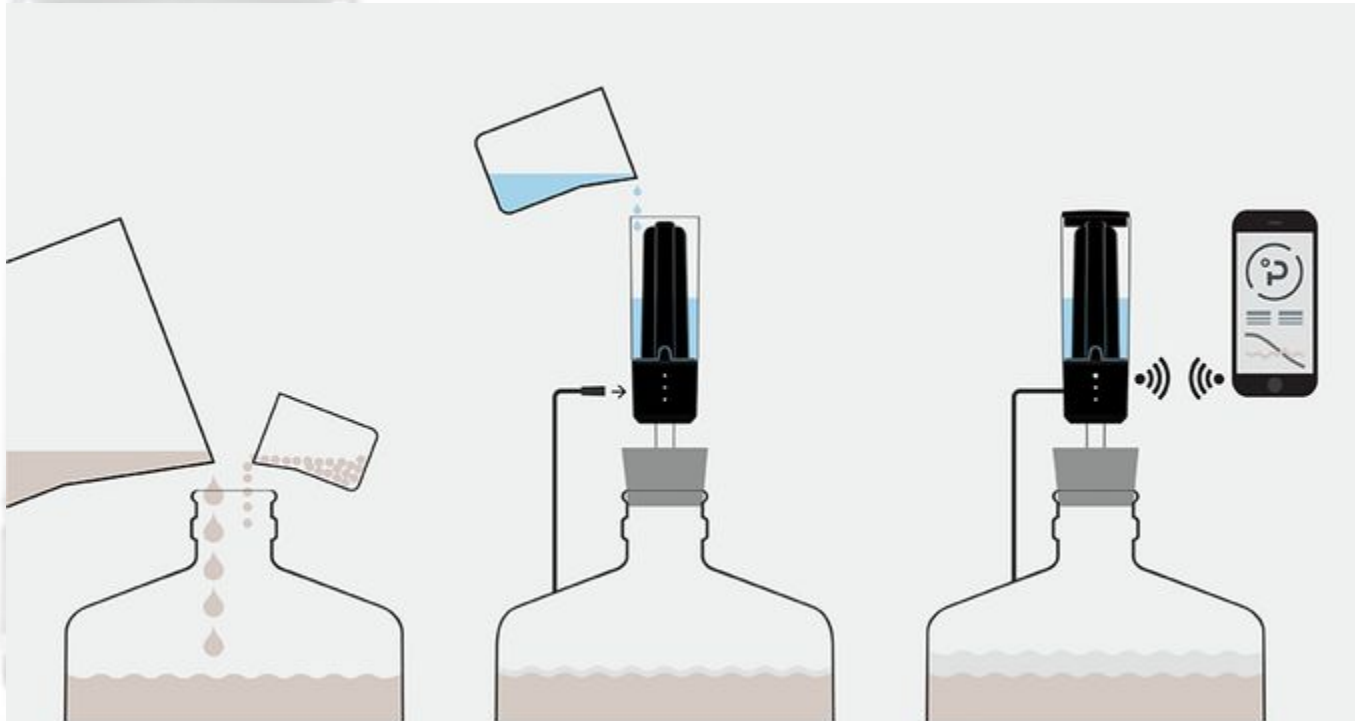
<https://www.brewperfect.com/>

<https://straighttothepint.com/getting-started-with-your-beerbug-digital-hydrometer-a-practical-guide-for-new-users/>

<https://www.homebrewohio.com/the-beer-bug-beerbug-wifi-digital-hydrometer-for-homebrew-beer-brewing/>

Plaato Digital Hydrometer Basics

- “3 piece” type airlock measures bubbling rate
- Proprietary algorithm correlates rate to change in gravity
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Plaato Connectivity and Cost

- Connects to Plaato servers over wifi
- Control via app
- Price: \$129

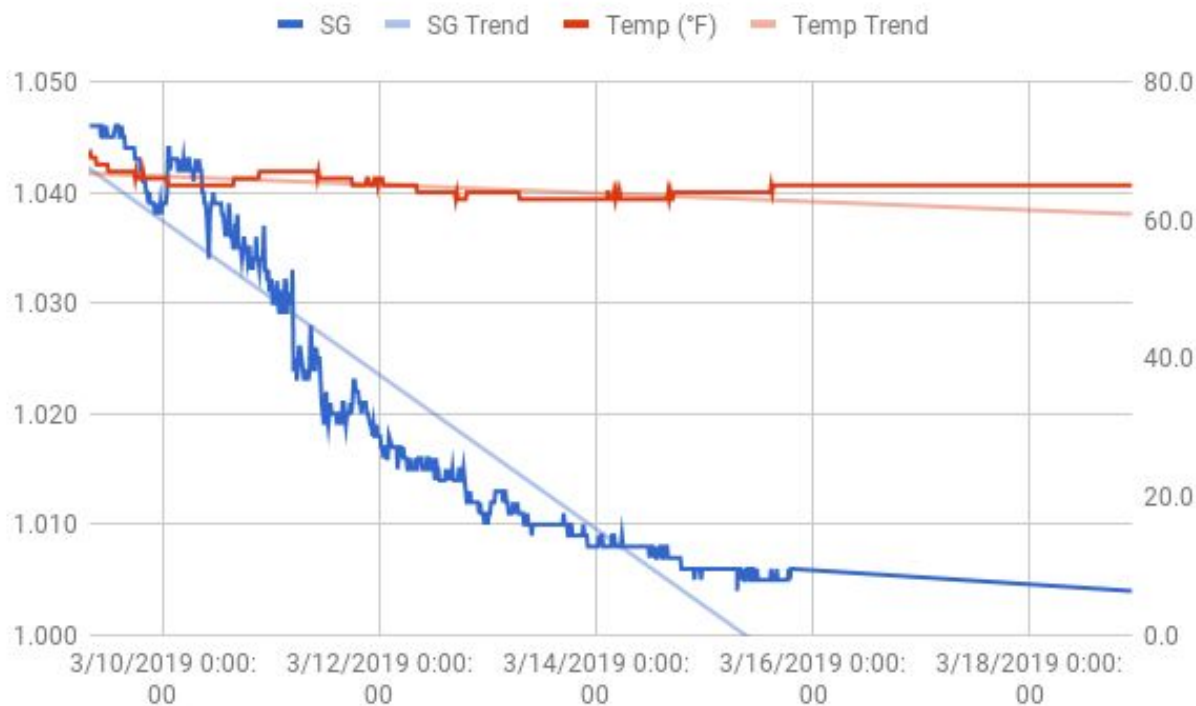


Plaato Pros and Cons

Pros	Cons
Anecdotally: easy to install and use software	Over-active fermentation may overfill airlock
	Relies on algorithm for CO ₂ ->gravity

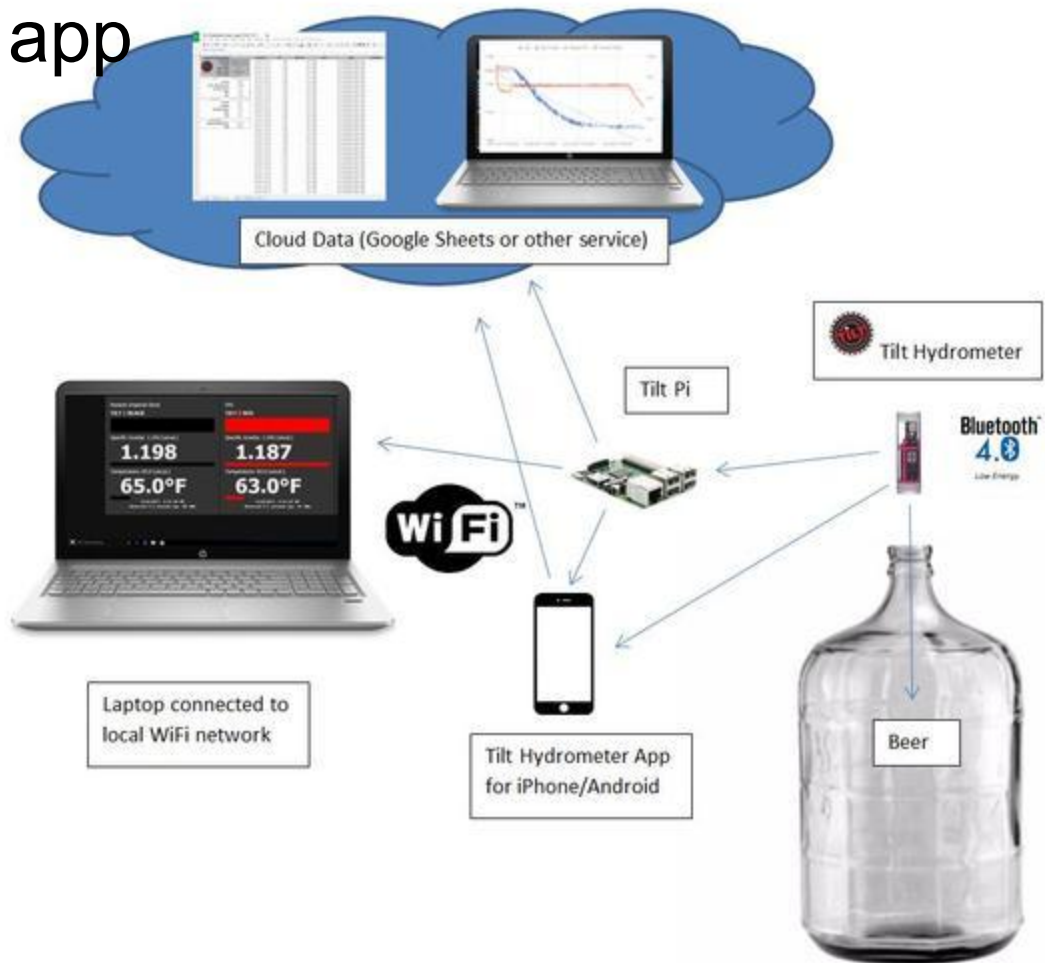
TILT Basics

- Free-floating bob sits in fermenting beer
- Two accelerometers measure “tilt” of bob in beer
- Algorithm correlates tilt angle to liquid density
- Onboard thermometer



TILT Connectivity and Cost

- Connects to wifi device via Bluetooth
 - Can be phone, tablet, or Raspberry Pi
- Control thru free app
- Price: ~\$130

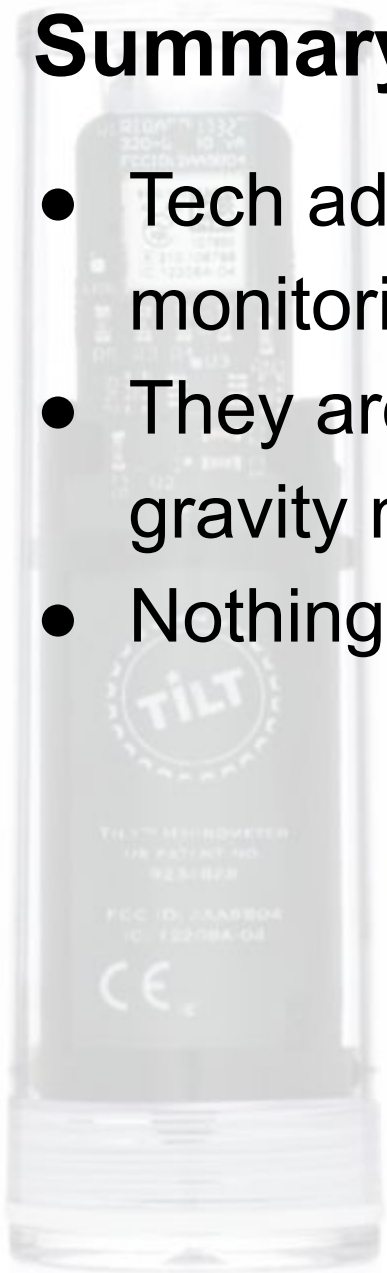


TILT Pros and Cons

Pros	Cons
Does not block fermenter opening - can be easily used in any vessel	Relies on algorithm for tilt angle->gravity
Easy to clean/sanitize, and deploy	Anecdotally: Mildly difficult setup and software use

Summary

- Tech advances allow for remote fermentation monitoring
- They aren't perfect or should be used for absolute gravity measurements
- Nothing beats a hydrometer/refractometer



Digital Brewing - Into the Future!

Inkbird temperature controllers

digital thermometers

programmable all-in-one systems

electric brewing using PID controllers

~~touch-free hydrometry~~

Pi boards or other PC interfaces

Interested? Email us at tech@bayareamashers.org