DICKSON

insights

May 2016 ▪ CD300

THE ARGUMENT AGAINST

GLOBAL WARMING

PLUS: Treating Cancer • Drug-Resistant Bacteria • Replaceable Sensors

Things Get Heated.

Climate Change Conversation **Rages On.**

JEFF RENOE ▪ **DICKSON INSIGHTS** EDITOR-IN-CHIEF

As citizens of the United States and a small piece of a global community, there are many conversations where we find ourselves fully entrenched on either one side or the other.

Whether that conversation is a frivolous one, "who makes the world's best pizza?", or a serious one, "Which political candidate is least likely to fail as a leader?", chances are you have an opinion on the subject. Things often even get heated when friends and combatants have opinions that differ on the subject at hand.

One such conversation that's gotten many people's blood boiling involves disagreements related to global warming. Regardless of what you believe is happening with the Earth's climate, there's someone somewhere that disagrees. Considering how 2015 set records as the warmest year on record, there would seem to be a lot of ammunition for believers. However, there are those that continue to argue against its merits. In this month's feature we explored one argument that is made by non believers to understand what merit, if any, exists within it.

You'll find stories similar to this in the pages that follow with more information often available online at **blog.dicksondata.com.**

Thanks for reading, and I hope you enjoy the May issue of **Dickson Insights.**

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In Case Of Emergency, Break Glass

For decades, doctors have hid a stash of drugs in the back of their medical toolboxes with a pane of glass over the top that read, 'only break in case of emergency'. Because they were rarely used, bacteria hadn't had a chance to evolve a defense against them. That lack of genetic evolution has made these drugs a go to against stubborn pathogens that showed immunity against other medicines. Doctors would only call on them in extreme, or sometimes even dire, circumstances. They were the medical equivalent of a last line of defense. Unfortunately, thanks to the fall of colistin, those defenses aren't as strong as they once were.

Late in 2015, it was discovered that bacteria sampled from pigs and people in south China had become resistant to the colistin drug. Even though it's been around since 1959, it had seen limited use because it can be toxic to the kidneys. It was included in a group of drugs that doctors had to choose from as a last resort for that reason. Even as a last resort option, it was rare to see it used because of the damage it could cause on the body. This fact allowed it to be spared during the last round of bacterial evolution that allowed some microbes to begin resisting a number of these last resort drugs. Once doctors had broken the glass on those drugs, the only one that remained was colistin. At that point, it truly became the last resort for medical professionals, and now even that is slipping away.

One of the big questions that must be asked is, if colistin wasn't being used commonly, how did bacteria suddenly evolve to defend against it? The answer actually falls outside of medicine and into the world of agriculture. According to National Geographic, coliston is a relatively cheap drug, and because of its affordability, it is used as an additive to animal feed. Once it is in the feed, it allows animals to put on muscle mass faster and helps to guard them against the rigors of intensive farming.

This resulted in the mass use of the drug in Chinese livestock, thus it's appearance in pigs. As the food chain did it's thing and pork was ingested by the Chinese, the resistance was able to transfer to people, which has led us to where we are today. What makes this even more concerning is that the gene that has granted resistance to the drug is able to freely move from one form of bacteria to another, meaning that the evolution process could very well work against the drug at a pace even faster than ones that came before.

Visit the dickson blog (http://bit.ly/DKSNevolve) for a video explanation on just how this happens.

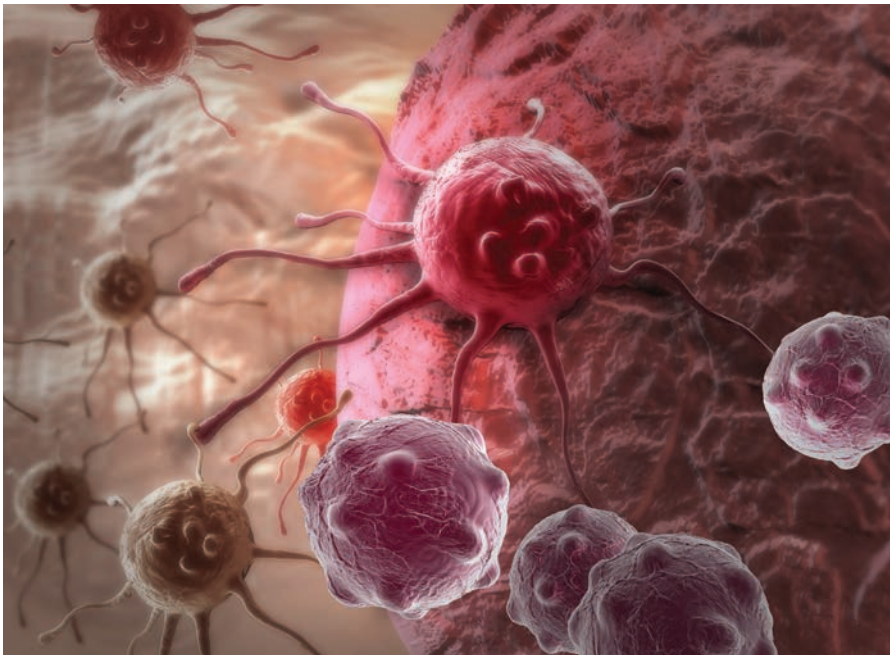
For now, a rally cry has gone out to bring change to international agricultural regulations. Even if such a change can happen quickly, the fear is that we'll still eventually reach a point where doctors will be less willing to attempt surgery out of fear that a serious bacterial infection could develop. Without drugs to remove such harmful organisms, the mortality rate of even simple surgical procedures could see a drastic shift in the wrong direction and that's something none of us will want to face. Only time will tell if Darwinism will ultimately prevail.

D

New Reasons For Optimism

Cancer Treatment **Breakthroughs**

By the time you finish reading this piece, statistics suggest that another three patients will have lost their battle with cancer. However, recent breakthroughs in cancer treatment may help that number shrink in the future.



While the medical community is far from ready to declare a cure has been found, former President Jimmy Carter has given the world reason to believe. In August of last year, the announcement came that the former President had begun cancer treatment for Melanoma that had spread into his brain. Just four months later he'd announced that he was cancer free. The rapid healing has raised hope among both the medical field and for patients who suffer from the disease.

TREATMENTS OF THE PAST

Historically, the most common forms of cancer treatments involve surgery, chemotherapy and radiation; all of which can be equally hard on the body as the disease itself. While the risks of surgery are evident, both of the other forms can be equally damaging. Chemo is a strong drug that goes in to kill cancer cells. It is powerful, but also can affect normal cells too. Radiation therapy uses special equipment in order to target cancer cells with high doses of radiation. This form of treatment has a shelf life, as the body can only safely handle a certain level of radiation before it is no longer possible without permanently damaging the body.

Through these methods, the UK Cancer Research Center estimates that only 50% of cancer patients survive for 10 or more years after initial diagnosis. While the survival rate in the US has gotten better in the past decade the numbers may not be as drastic as you'd believe. As of 2011, men were 1.8% more likely to survive than the decade before, and women were only 1.4% more likely.

TREATMENT OF THE FUTURE?

This new solution is called immunotherapy and it works to fight against one of cancer's biggest affects; it's ability to override a patient's immune system by "overriding their 'immune checkpoints'" as defined by Dr. Catharine Paddock in an article she wrote for Medical News Today. This version of treatment counteracts the override and allows a patient's own immune system to fight off the cancer directly.

According to Dr. Padmanee Sharma, the scientific director of the Immunotherapy Platform at MD Anderson Cancer Center in Houston, "The immune system is very very powerful. But...everyone's immune system has these off switches."

It's these off switches, or checkpoints, that this therapy attempts to block.

"...If you block these off switches, you allow the immune system to go for longer periods of time, which is what is necessary to allow for tumor rejection in cancer patients," she continued.

Unfortunately, studies have shown that immunotherapy treatment has only worked for about 30% of patients. As quickly as doctors are trying to learn, they still need to understand more in order to best treat the problem.

"There are...different types of switches," Sharma says. "The drug that President Carter received blocked one of those off switches, but there are many, many other off switches and so we need to understand which tumor types they're playing a role in and which patients they're playing a role in so that we can block the appropriate off switches. Maybe we need to block multiple off switches so that we allow the immune response to take off and do its job in more patients."

For now, immunotherapy treatments are only FDA approved for three types of cancer, but the hope is that additional development can help such a tactic be used on a much wider group of patients. Until then, it would seem the dangerous will still be required to combat the deadly.

You can read more about immunotherapy treatment online by visiting the website of the American Cancer Society.

DicksonOne

Wireless Temperature and Humidity Monitoring

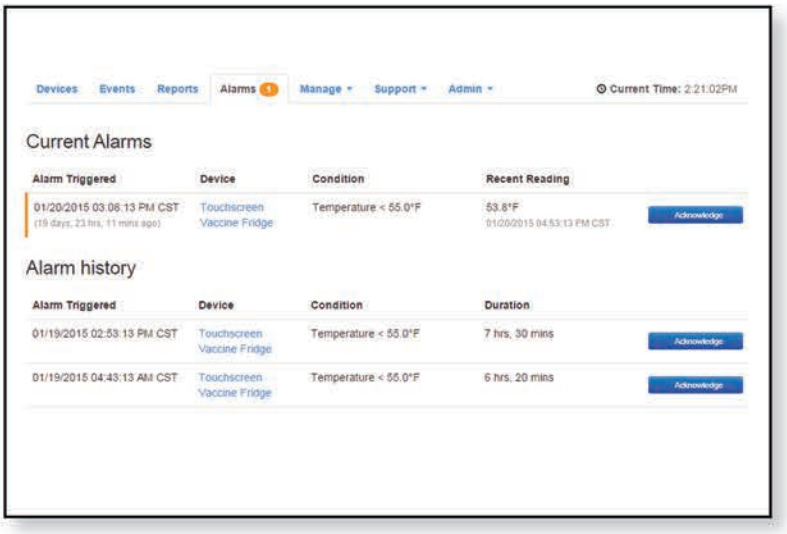
HOW IT **WORKS**

When you log onto **DicksonOne.com**, your environmental data, from every location, appears before your eyes. Charts and pens, get outta here. USB cords and software on a disc, you too. **DicksonOne** Loggers transmit your data wirelessly to the **DicksonOne** Cloud, where you can access it anytime.

Power Over Your Environment

EMAIL, TEXT & PHONE CALL ALARMS

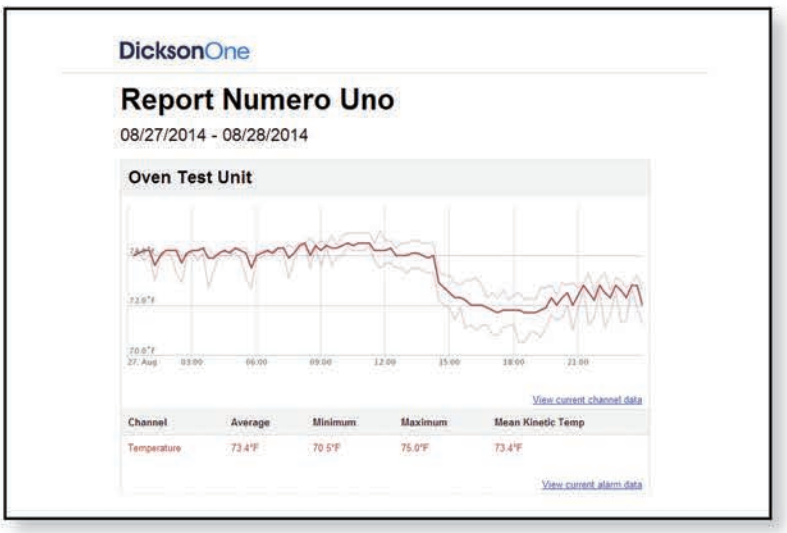
When something bad happens in your facility, **DicksonOne** can send anyone in your organization an email, text, or phone call. Temperature too high? Humidity too low? We've got you covered.



CUSTOMIZABLE REPORTS

The DicksonOne Reporting Suite allows you to:

- Create and customize reports for any and all of your loggers
- Choose who in your organization will receive which reports
- Change and modify the frequency of reports



TEMPERATURE MAPPING SERVICES

KEEPING YOUR PRODUCTS SAFE

HOW IT **WORKS:**

WHAT **YOU GET:**

- Warehouse Mapping
- Problem Spot Analysis
- Refrigerator, Freezer, and Incubator Mapping
- Control System Analysis
- Acceptance Criteria Creation
- Temperature Recovery Studies
- Self-Mapping Kits
- Temperature and Humidity Monitoring Consultation

WHAT **WE OFFER:**

- 90 Years of Temperature Mapping Experience
- A team of expert Consultants, Engineers, and Mapping Technicians
- 21CFR11 Compliance
- High Accuracy, High Reliability Data Loggers
- A2LA Calibrated Temperature Recorders
- Secure Data Recovery, Analysis, and Distribution

Meet The New

DicksonOne Logger

THE BEST JUST GOT BETTER

Larger, More Detailed Display ▪ Compatible with New Universal Replaceable Sensors

Over the Air Updates ▪ Smaller Footprint

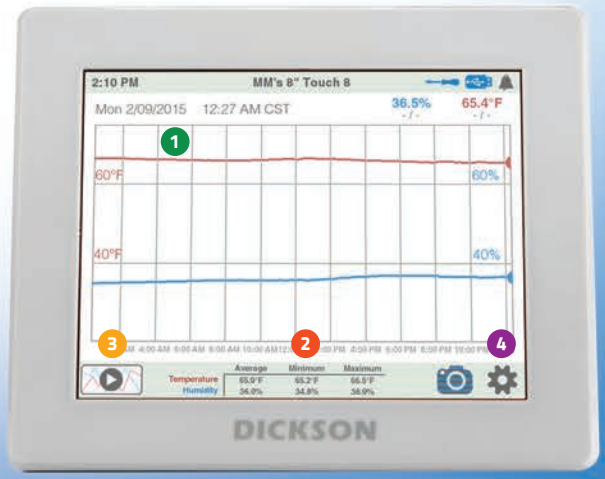
Updated Design

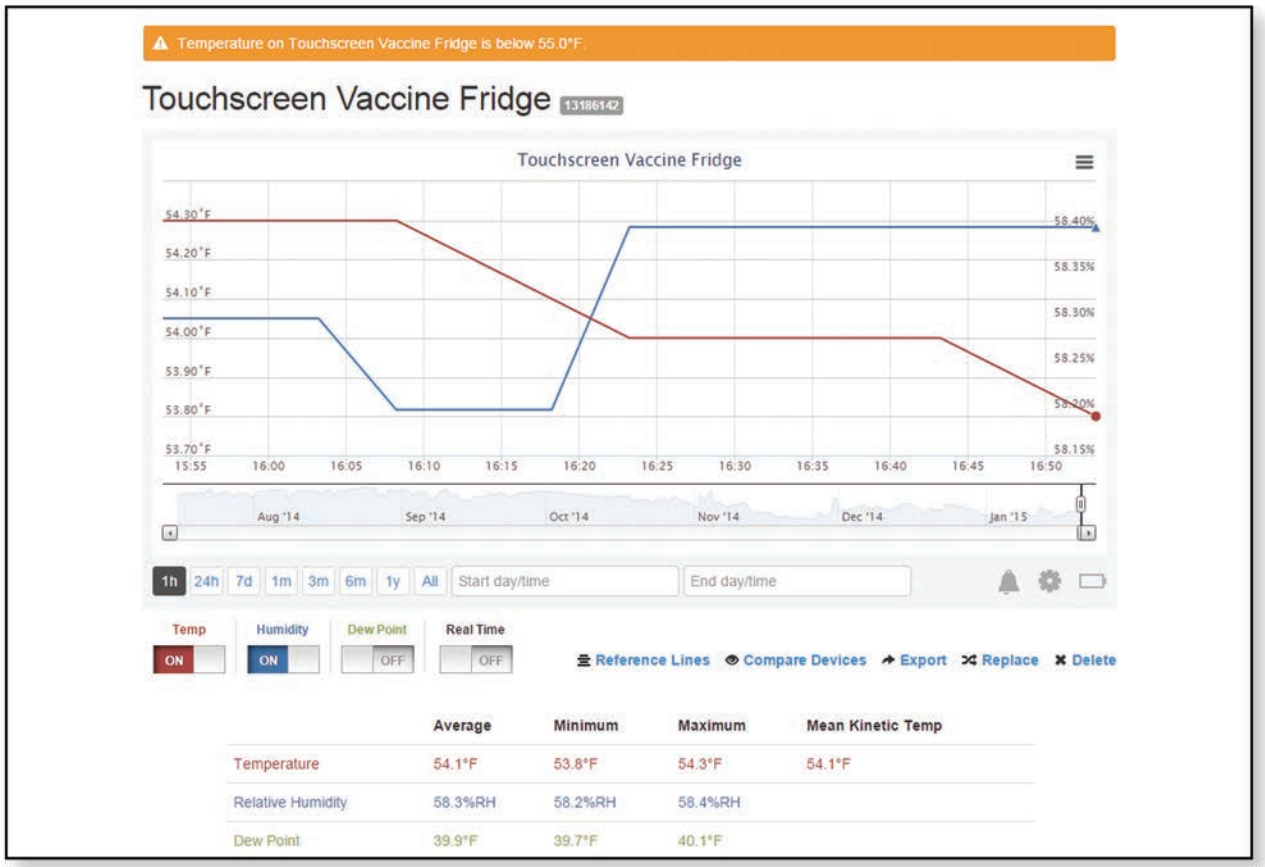
DicksonOne **Touchscreen Loggers**

Our goal when designing the new line of **Touchscreen Data Loggers** was to create a feature-heavy and easy-to-use device that allowed users access to their entire data history, anywhere. We pushed the limits of connectivity, user-interface, and functionality, to deliver the most robust data logger on the market.

Data At The Source

1. **The Graph** Your environmental history just got a whole lot easier to navigate through. We overhauled the user-interface, and made it easy to view and manage your data.
2. **Your Channels** Every touchscreen will automatically calculate the minimum, maximum, and average temperatures of your selected view.
3. **Real-time Monitoring** Push the play button, and your device will update back to the most recent set of readings.
4. **Device Settings** Your Touchscreen is robust. When you navigate your devices settings, you can adjust sample rates, set alarms, and connect to DicksonOne.





NOW WITH **DicksonOne**

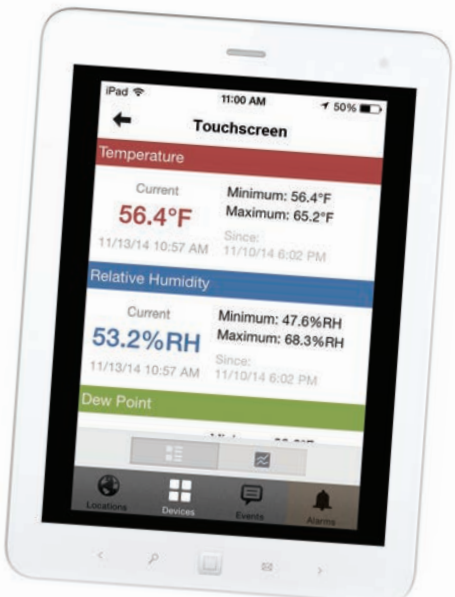
The **Touchscreen** now gives you the option to connect directly to **DicksonOne.** You get all of your data at your fingertips, and now you can access it anywhere too. Just connect your device to your local WiFi network or plug it into an Ethernet port, log into **DicksonOne**, and boom, complete data control.

DicksonOne Allows You To:

- Get email, text, or phone call alarms from your Touchscreens.
- Access every one of your Touchscreens' data history on one website.
- Generate customizable reports, delivered directly to your inbox when you want.

The new Touchscreen allows for USB download to DicksonWare.

Only DicksonWare A017/A027 will function with Touchscreen Loggers.



DicksonOne
Touchscreen

MODEL	REMOTE PROBE
TSB	USB Download
TWE	DicksonOne WiFi/Ethernet Connection and Download
TWP	DicksonOne Download and Power over Ethernet

The TSB, TWE, and TWP all allow for basic USB download independent of DicksonOne. Use DicksonWare A017/A027 for USB download with these models.

DicksonOne
Display Logger

MODEL	REMOTE PROBE
DWE	DicksonOne WiFi / Ethernet Connection and Download

DicksonOne
Software

DEVICES	FEATURES
1 to 10	Unlimited Data, Multiple Sample Rates, API Access, Email, Phone, and Text Alarms
11 to 25	Unlimited Data, Multiple Sample Rates, API Access, Email, Phone, and Text Alarms
26 to 50	Unlimited Data, Multiple Sample Rates, API Access, Email, Phone, and Text Alarms
51 +	Unlimited Data, Multiple Sample Rates, API Access, Email, Phone, and Text Alarms

* Dickson offers a Basic Plan with a rolling window of 30 Days of data. One hour sample rates for unlimited loggers at no cost.

Calibration In Five Seconds

HOW REPLACEABLE SENSORS **WORK**

Dickson Replaceable Sensors are Dickson's answer to the headache of calibrating your temperature or humidity monitoring device. When your device needs to be calibrated, just pop off your sensor and pop on a new one. It's that easy. Now when you order a DicksonOne or Touchscreen Logger, you get the benefit of never having to ship a logger back to us again.

WITHOUT REPLACEABLE SENSORS

1. Order a recalibration for your device
2. Acquire a Return Authorization Code from a Dickson Representative
3. Take unit out of its environment
4. Move products out of environment/install backup monitoring system
5. Box unit up
6. Ship unit to Dickson
7. Dickson recalibrates unit and ships it back
8. Receive the unit
9. Disassemble backup system/move product back into environment
10. Reinstall unit/system

Total Down Time: 7-10 Days

VS

WITH REPLACEABLE SENSORS

1. Order a Replaceable Sensor
2. Take old sensor off, put new sensor on

Total Down Time: 0 Days

All DicksonOne and Touchscreen Loggers are

RS COMPATIBLE.

High Temp Solutions

D605 Probe sold separately. For more information on Dickson's Probes and Accessories, visit **dicksondata.com.**

1. **HT 300 Waterproof, High Temperature Data Logger** HACCP and FDA Compliant. USB Download. IP68 Rating. Temperature Range -40° to 257°F (-40° to 125°C).
2. **HT350 High Temperature Process Logger** HACCP Compliant, K-Thermocouple Probe, USB Download, and a large temperature range. Temperature Range -40° to 257°F (-40° to 125°C).

Instant Data Solutions

3. **TC700/TH700 Touchscreen Handheld Indicator** Instant temperature or temperature/humidity data. No-slip silicone cover. Battery powered.
4. **RL200 Report Logger** We decided to make the best compact data logger on the market, our RL200. With a new outer case, user selectable logging times, and redesigned PC interface, it's exactly what you need.

Temperature and Temperature/Humidity

Chart Recorders

Want a physical readout right where you are monitoring? Our Chart Recorders have you covered. For ninety years we've built the best chart recorders in the business. Check out our models below.

8 and 6 Inch Models

Eight and Six Inch Chart Recorders display detailed temperature and humidity values.

MODELS AND FEATURES

KT6P	6 Inch Temperature
KT8P	8 Inch Temperature
TH6P	6 Inch Temperature and Humidity
TH8P	8 Inch Temperature and Humidity

4 and 3 Inch Models

Four and Three Inch Temperature Chart Recorders designed to fit any application.

MODELS AND FEATURES

SL4350	4 Inch
SL4100	4 Inch
SC3 Series	3 Inch

Charts sold separately. For charts and accessories, call **630.543.3747** or go to **www.DicksonData.com.**

PRESSURE DATA LOGGERS

Pressure Data Logger One second sampling rate. User replaceable battery. Optional delayed start. USB connectivity. Pressure sensor includes built-in diaphragm seal.

PR125	0-100 PSI
PR325	0-300 PSI
PR525	0-500 PSI

Rugged Utility Pressure Data Logger Water resistant case. 3 year battery. Unobtrusive design. Fits easily in a toolbox. USB Connection.

PR150	0-100 PSI
PR350	0-300 PSI

PRESSURE CHART RECORDERS

4 and 8 Inch Models

Four and Eight Inch Chart Recorders to meet your needs.

Single AA battery powered. Rugged low-maintenance design features. 7-day or 24-hour recording times. 1/4 inch NPT Connector.

MODELS AND FEATURES

0-100 PSI	**PW860/1**	**PW470**
0-200 PSI	**PW864/5**	**PW474**
0-300 PSI	**PW866/7**	**PW476**
0-500 PSI		**PW479**
0-1000 PSI	**PW875**	

Charts sold separately. For charts and accessories, call **630.543.3747** or go to **www.DicksonData.com.**

MAPPING DATA LOGGERS

SP125 Temperature Logger. Accuracy ±1.2°F, ±0.67°C. Range -10 to 176°F, -23 to 80°C.
SP175 Temperature Logger with Thermocouple Probe. Accuracy ±1.8°F, ±0.1°C. Range -300 to 2000°F, -30 to 50°C. A203 Probe required for +500°F.
TP125 Temperature and Humidity Logger. Accuracy ±0.8°F, ±0.45°C. Range -10 to 176°F, -23 to 80°C.

SK550 Temperature. Pack of twelve. Accuracy ±1.8°F, ±1°C. Range -4 to 158°F, -20 to 70°C.
TK550 Temperature & Humidity. Pack of twelve. Accuracy ±1.8°F, ±1°C. Ranges -4 to +158°F, -20 to +70°C.

DISPLAY DATA LOGGERS

SM300 Temperature Logger. Range -4 to 158°F, -20 to 70°C. Accuracy ±0.8°F, ±0.44°C.
SM320* Temperature Logger. Remote Probe. Range with Probe -300 to 2000°F, -184 to 1093°C. Accuracy ±1.8°F, ±1.0°C.
SM325* Temperature Logger. Two Remote Probes. Range with Probe -300 to 2000°F, -184 to 1093°C. Accuracy ±1.8°F, ±1.0°C.
SM420 Temperature Logger. Remote Probe. Range with Probe -50 to 350°F, -45 to 176°C. Accuracy ±0.5°F, ±0.28°C.
TM320 Temperature and Humidity Logger. Range -4 to 158°F, -20 to 70°C. Accuracy ±0.8°F.
TM325 Temperature and Humidity Logger. Remote Probe. Range -40 to 185°F, -40 to 85°C. Accuracy ±0.8°F.

SP425 Temperature Logger. Digital Display. Accuracy ±1.2°F, ±0.67°C. Range -4 to 158°F, -20 to 70°C.
TP425 Temperature and Humidity Logger. Digital Display. Accuracy ±0.8°F, ±0.45°C. Range -4 to 158°F, -20 to 70°C.

A SPACE ODDITY.

Satellite Temperature Measurements Offer An Argument Against Global Warming

In the war on climate change, chances are you fall firmly on one of two sides of the conversation. You either believe it's occurring, or you don't. Considering how 2015 set records as the warmest on record, there would seem to be a lot of ammunition for believers. However, there are those that continue to argue against its merits.

Recently, ABC News published an article that detailed one of the main arguments that non believers have used to defend their position. It involves temperature data that has been recorded from a point 50,000 feet above ground using a satellite. Based on data that's been collected via one satellite measurement system there has been no global warming in 18 years. Scientists argue that all of this data is misleading because the difference between temperature measured six feet off the ground is much different than those taken from 50,000 feet above it.

As Texas Tech climate scientist Katharine Hayhoe argues in the piece by ABC, "We care about what's happening where we live. That's why ground-based temperatures are most relevant to humans."

John Christy from the University of Alabama in Huntsville disagrees. He depends on data from satellite temperature monitoring systems because he believes that "the surface is affected by too many other variables." In his words, ground measurements don't do a good enough job of measuring the real mass of the climate system.

Regardless of their arguments, they both seem to agree that the data differs depending on where the measurements are taken. While that may seem obvious - just stand at ground level and look at the snow topped peaks of the Rocky Mountains - what's important for this debate is comparative temperature change. 2015 was the warmest year on record compared to all other measurements taken from six feet off the ground, however it was the third warmest compared to all other measurements taken via satellite.

One major variable that could be affecting temperature on the ground is heat transference. This occurs in three fundamental ways: Conduction, convection and radiation.

Conduction: The transfer of heat between two parts of a stationary system, caused by a temperature difference between the parts. Heat will always transfer into the cooler object until both reach equal levels. For example, when you touch a hot pan on the stove the heat is attempting to transfer from the metal onto your skin. If you were able to maintain contact with the pan, the heat would continue to transfer into your hand until the temperature in both objects was equal.

Convection: When heat transfers through fluids, such as air or water, the heat moves away from the source and carries energy away with it. The easiest way to think about convection is to think of the way the air feels in your own home. if you have ever been in, or own, a home with multiple levels, chances are you've experienced convection first hand because warm air rises. That's why an upstairs bedroom may often feel so much warmer than one on the lower level.

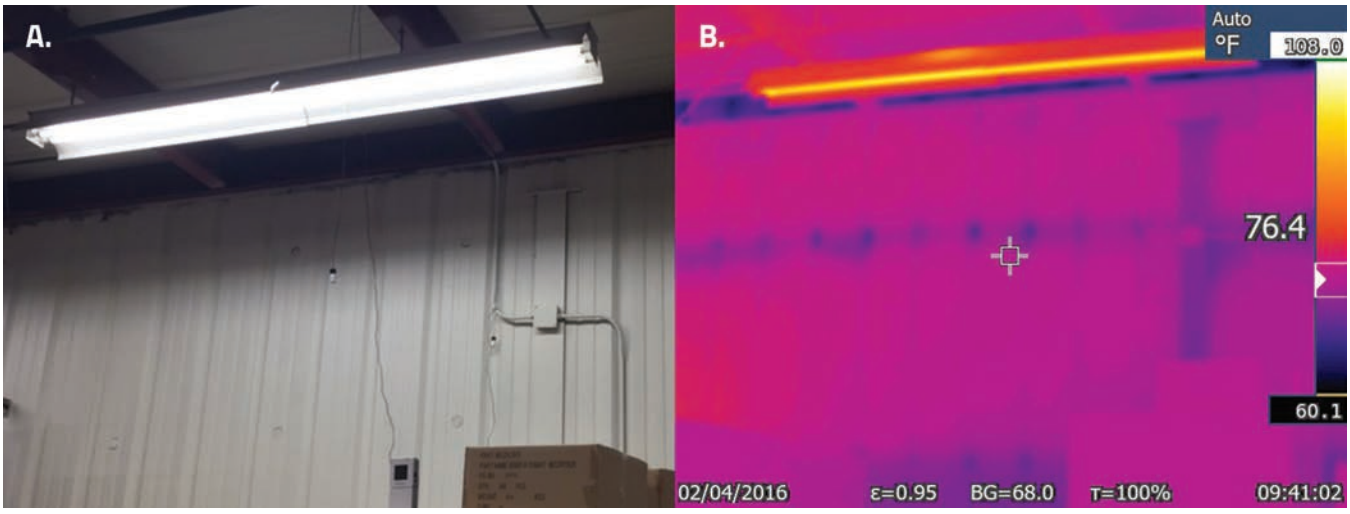
Radiation: If heat is transferred by electromagnetic waves then it has done so via radiation. If you put your hand near a car's hood in the heat of the summer, chances are you can feel the heat emitting, or radiating, off of it. This type of transference increases the temperature of the area surrounding it.

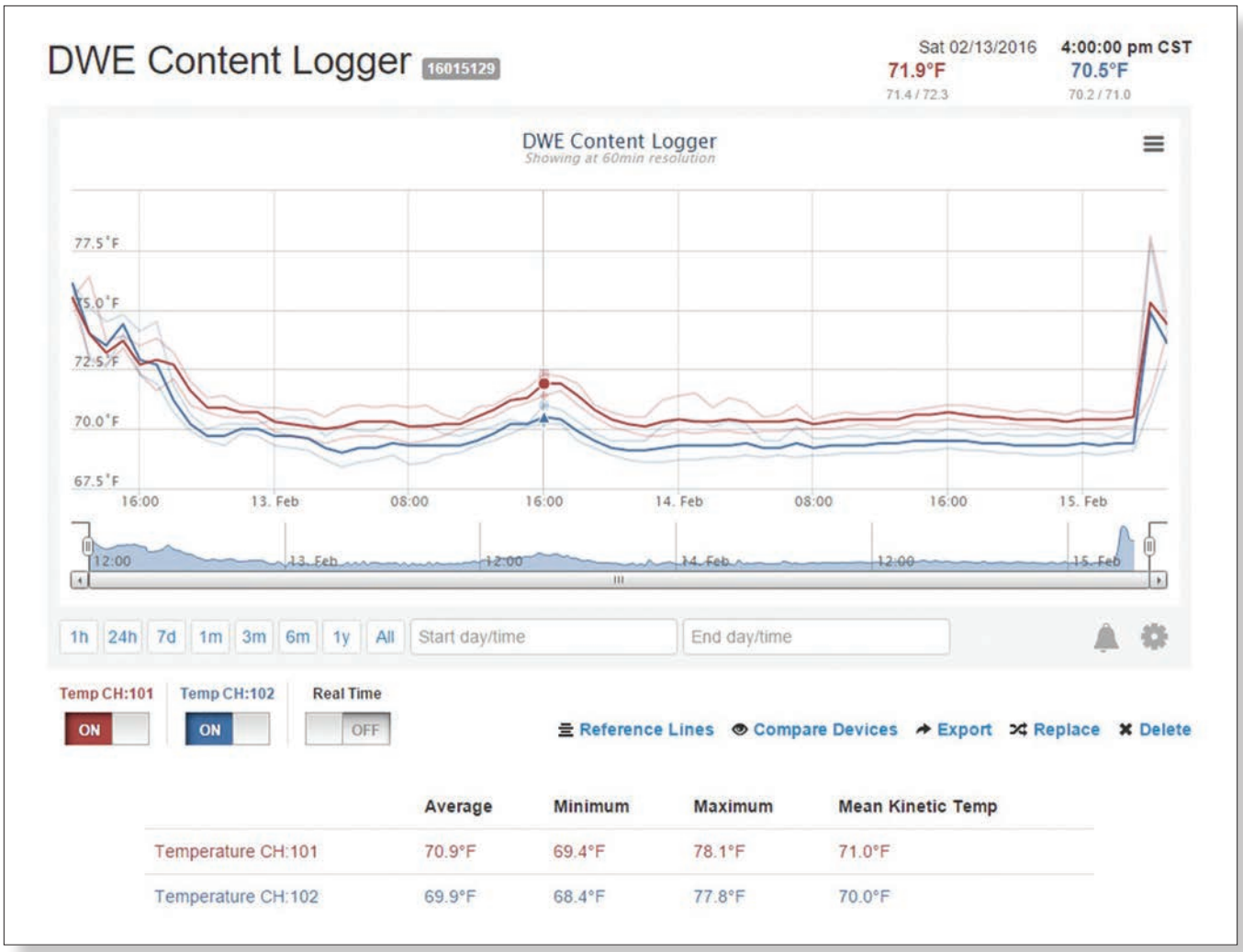
To give an example of such transference, think about a locked car on a hot day. As the sun shines on the glass the heat will transfer through conduction into the surrounding air of the vehicle. The air inside the car will then use convection to circulate and warm the remaining aspects of the car's interior including things like dark colored vinyl around the dashboard and the door. These dark vinyl portions will radiate the heat it absorbs continuing to exacerbate the problem. In only ten minutes, the interior temperature of a car can raise by nearly 20 degrees from 80 to 99 . Within thirty minutes it can measure at 114 .

If one were to consider the amount of energy that is transferred and radiated by all of the buildings and structures across the globe, then it becomes easier to at least understand why some believe measurements from 50,000 feet above the ground are more valuable for gathering a realistic look at how climates have changed. By removing even one variable you can get a better look at how the actual climate on earth has shifted over time. Unfortunately, that doesn't change the fact that it's still really warm at ground level, and that's why members on both sides of the community continue to push the topic.

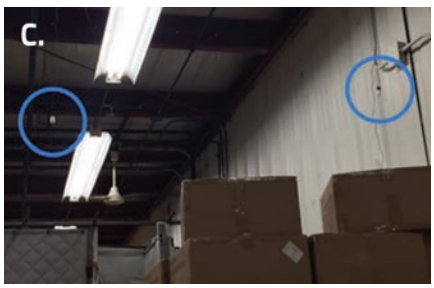
These factors are not exclusive to the outdoor climate and can affect indoor structures equally. We've included a number of images of our warehouse to help showcase these effects.

In image A you can see an outer lying wall of a warehouse. In image B, to its right, you can see the temperature differences, specifically along the horizontal line right through the center of it. We decided to look at how this residual change may radiate a temperature into the surrounding area comparatively to air that sits approximately six feet away by using our RTHM-2 dual glass bead thermistor probe. We chose this probe type to get a general look at the temperature





differences between the two placements as opposed to the extreme jumps that may exist over time. Image C shows just how this was done for the purpose of the experiment.



In the chart above, you can see the average temperature between the two probes was, on average, one degree with a shift at times by as much as two. This difference occurred when the two probes were only six feet apart, and could have been much more drastic had they been placed further apart. Something else worth noticing is how drastic of a change there was between the weekend and the work week when the temperature climbed as high as nine degrees above the minimum.

Regardless of which community you're a part of, one thing is certain; this is a conversation that's only going to continue heating up as we move forward.

If you need to rethink a mapping strategy because a location within your structure may not be properly monitored, visit dicksondata.com/warehouse-mapping-guide for a step by step guide or blog.dicksondata.com/2015/09/temperature-humidity-mapping-learn/ for tips and tricks. We also have Mapping and Validation Experts to help you develop a plan that works best for your facility. For more info call: 630.543.3747.

CHECK OUT THE DICKSON BLOG!

Like what you've read? Find more great information about temperature on our blog: **Blog.DicksonData.com**

DICKSON
930 South Westwood Avenue
Addison, Illinois 60101-4917

PHONE **800.323.2448**
FAX **800.676.0498**
www.DicksonData.com

Replaceable Sensors
Calibration Made Easy

A few years ago, we set out to engineer a way for our customers to calibrate their loggers and recorders, without ever having to send the devices back to us. What we ended up with was Replaceable Sensors.

What are these things?
Replaceable Sensors measure the temperature or humidity of your environment, and then send that signal to your data logger for storage. They are calibrated independently of the device.

What does that mean for you? If you calibrate your data loggers and chart recorders (which you should be doing) it means never, ever having to send your device back in to Dickson for a calibration. Replaceable Sensors take the phrase "down time" out of calibration.

Interested? Visit **dicksondata.com/replaceable-sensors** to watch a product video, and view products that use Replaceable Sensors.

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