DICKSON
insights

AN AGING
POWER GRID

Are you prepared for an outage?

INSIDE:

FOCUS FEATURE
Get More from Your System
by Doing Less

PHONING IT HOME
A Prick-Free Solution
for Diabetics

HUMAN MACHINES
Blurring the Line Between
Man and Machine

FEATURED PRODUCT
OF THE MONTH

DSB • PAGE 12

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LETTER FROM THE EDITOR

BLIND FAITH

Trust in the power grid could cost you.

Before electricity was first discovered, life moved at a slower pace. We traveled by steam or horse. We awoke to the sun or the rooster. We worked evenings by way of both candlelight and moonlight. That's all changed, though, thanks to the modern electrical grid.

Today it's hard to find a product that doesn't involve a microchip, let alone some sort of power. We rely on it to get to work, to do our jobs, and even to keep us safe. Sometimes, though, power escapes us and everything that'd been previously illuminated suddenly becomes lost in darkness. It forces everything to a grinding halt, and puts much of what we do, be it both work or pleasure, at risk of loss.

In the pages that follow, you'll learn more about how going dark isn't just a possibility, but a trend that is threatening your home and business the longer time progresses, as well as find articles relating to keeping your assets safe and your auditors happy.

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

JEFF RENOE
INSIGHTS EDITOR-IN-CHIEF
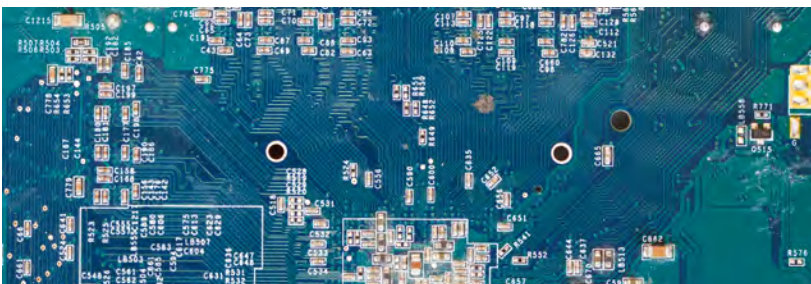
We're not saying Skynet is an inevitability, but man and machine are integrating like never before. **Check out page 10** to learn more about how human cyborgs may be a thing of the future.

INSIGHTS

FEATURE

ALSO IN THIS ISSUE

SETTING
THE STANDARD
Calibration Services

Calibrations are essential to all devices that measure a variable. However, we often get the questions, "Why isn't it accurate already?" and "Isn't it made to be accurate?" The answers are: it is, and yes. However, while our devices are accurate without calibrations, we can't be positive they are accurate to a specific measurable degree (and thus can't prove their accuracy) unless we perform a calibration.

HOW CALIBRATION **WORKS**

STEP ONE	STEP TWO	STEP THREE	STEP FOUR
We compare your sensor with a standard sensor in a stable environment across a range of temperature readings.	If there are any differences between the sensor and the standard, we adjust the sensor to align with the standard.	We run through this process multiple times, adjusting the device as it is compared at multiple temperatures.	We perform a final check of one or more points, depending on the order, and create the necessary calibration certificate.

CALIBRATION OPTIONS
What works for my company?

1-POINT **NIST**

- One specific temperature point (middle) calibration

- Good if your temperature varies little

- Choice to specify the temperature point to best reflect your application

3-POINT **NIST**

- Three-point (high, middle, and low) temperature point calibration

- Grants a larger proof of accuracy

- Choice to specify the temperature points to best reflect your application

Need help? **Let us be your calibration expert.** | 630.563.4212 | support@dicksondata.com

PHONING it HOME

How a New Innovation Could Cost Pharma Billions

By Jeff Renoe

A **NEW INNOVATION** could make living with diabetes a little less sour and a lot more sweet.

The diabetic market is worth more than $130 billion annually in the United States alone. That's why any advancement in treatment is important to monitor. Changes to technology and treatment could certainly put a dent in such massive revenue figures.

That's why the advertisement of a new smartphone app stopped us in our tracks. It's being talked about as a prick free monitoring solution by using a phone's camera to capture a series of images of the fingertip that gather information regarding the user's heart rate, temperature, blood pressure, and blood oxygen saturation.

This type of smartphone based, prick free test for glucose levels would be a major benefit for diabetics in this country, and there are a lot of them. As we've talked about in the past, the disease has reached epidemic proportions. There's been a major increase in diabetic patients over the last 35 years. On average, there's been a 4% increase each year since 1980.

OF THE MORE THAN 22 MILLION who suffer from the disease the majority are diagnosed with Type 2 diabetes. While the cause of Type 1 isn't yet clear, data has suggested that there are a number of things we can do, and often times don't do, to prevent Type 2. It's been linked to obesity, genetics and a sedentary lifestyle. To date, no cure has been produced for either type.

While the American lifestyle has negatively affected the health of so many of those Americans, the billion dollar industry has provided an obvious boon to pharmaceutical companies. Glucose monitoring itself, which includes monitoring devices, testing strips, and needles, makes up more than $10 billion of that total revenue.

"The global glucose monitoring device and diabetes management market has evolved significantly over the last four decades," said Bruce Carlson, Publisher of Kalorama Information. "The number of individuals with diabetes has grown dramatically, creating more demand for glucose monitoring devices and supplies. Meters are now smaller, faster, portable and more accurate that they were years ago, with many of them interfacing with computers."

Kalorama Information published a lengthy report on the Global Glucose Monitoring Market, and it is available for purchase on their website. According to a press release promoting the report, even as things change, the growth of monitoring isn't slowing down.

"The report says the glucose monitoring and diabetes management industry, in general, is continuing to expand. However, the landscape is changing to reflect wearable, less invasive methods of monitoring glucose. Technology is advancing at a rapid pace, bringing new options to both professionals and consumers alike."

THE MARKET WILL CONTINUE TO SEE ebbs and flows as new medical devices, like the monitoring app that is getting headlines, continue to get approval and release into market. While this device still has a lot of questions that need to be answered, like, "how accurate is this method compared to the standard method," only time will tell how new treatments and practices like this will impact the Pharma industry's bottom line. Only time will tell if it leaves the industry feeling sour or not. **D**

*For a list of sources used in this story, visit **DicksonData.com/blog** and search for "Phoning it Home."*

*Have something personal you'd like to add to the conversation? Send us your thoughts to **jeff@dicksondata.com** for a chance to be featured in a future blog or magazine.*

WELCOME TO
THE CLOUD

DATA AT YOUR FINGERTIPS. ANYTIME. ANYWHERE.

DicksonOne

TAKE
POWER
OVER YOUR ENVIRONMENT
with **Dickson**One

We've re-thought temperature and humidity monitoring making it easier, scalable, and cost effective.

Your data. How you want it. When you want it.

FocusFeature

LOCATIONS

Whether you're just trying to organize a few data loggers in a single facility or trying to organize devices and control access across a multi-national corporation, **Dickson**One's flexible locations structure will scale to meet your needs.
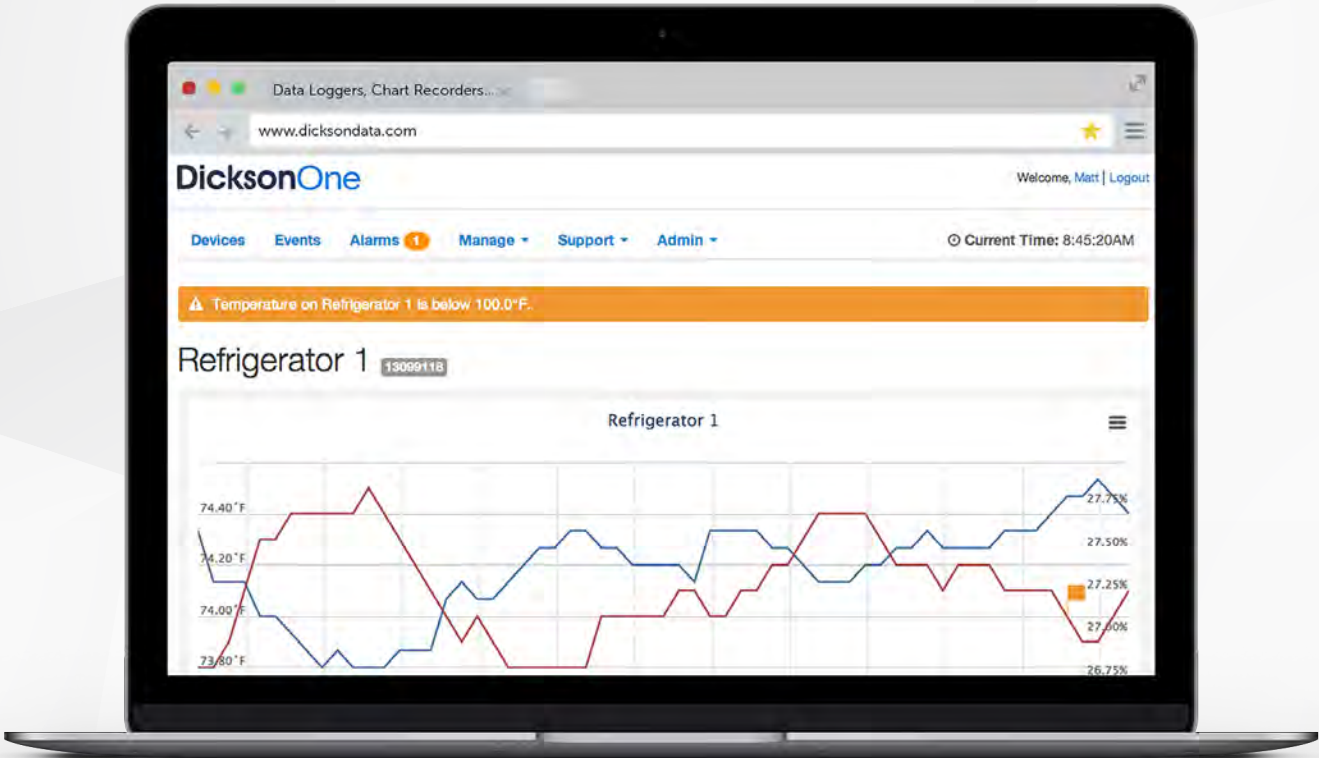
Secure
We utilize bank-grade security and Amazon Web Services for unparalleled reliability.

Anywhere
Wherever you are, access your data anywhere, anytime, 24/7.

Infinite
Securely store all your data in the cloud, whether you're recording for days, months, or years.

Automated
Devices send all collected data to the DicksonOne servers automatically, so you don't have to.
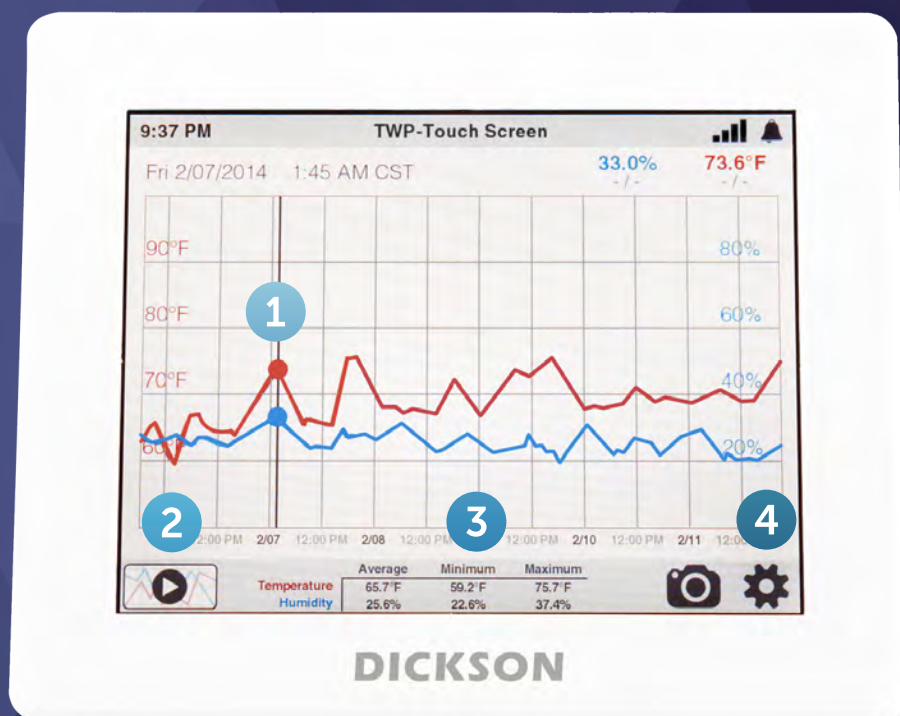
On Your Time
Create customizable reports delivered exactly when you want them.

Immediate
Receive real-time email, text, or phone call alarms when excursions occur.

Your data.
Only a Touch Away.

1 The Graph

We updated the user-interface, and made it easy to view and manage your data.
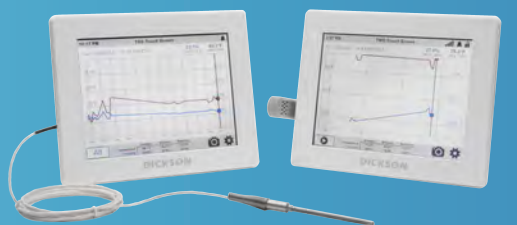
2 Monitoring

Pushing the play button brings you back to the most recent readings, updating the view in real-time.

3 Your Channels

The touchscreen automatically calculates and updates summary data for the selected time range.

4 Settings

Easily adjust sample rates, set alarms, and connect to DicksonOne.

DicksonOne Enabled • Capacitive LCD Touchscreen
Replaceable Sensors • WiFi, Ethernet, and USB Connectivity

The Touchscreen

The Touchscreen 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.

Email us at support@dicksonone.com • Talk to a specialist at 630.563.4212

DicksonOne
Touchscreen

MODEL	REMOTE PROBE	PRICE
TSB	USB Download	$424
TWE	DicksonOne Wifi/Ethernet Connection and Download	$524
TWP	DicksonOne Download and Power over Ethernet	$599

DicksonOne
Display Logger

MODEL	REMOTE PROBE	PRICE
DWE	DicksonOne Wifi/Ethernet Connection and Download	Starting at $350

DicksonOne
Software

One of the most common pain points when discussing monitoring is the retrieval of data. DicksonOne loggers send data to the cloud automatically, freeing up resources to do what they do best.

Per device billing now available!

$3 per device, per month
(requires a credit card)

BASIC	STARTER	REGULAR	PLUS	ENTERPRISE
$0	$300	$725	$1,400	Call for Quote
Unlimited Devices Data stored for 30 days 1 hour sample interval	1-10 Devices Data stored for life of account Multiple sample rates Email, Phone, & Text Alerts API Access	11-25 Devices Data stored for life of account Multiple sample rates Email, Phone, & Text Alerts API Access	26-50 Devices Data stored for life of account Multiple sample rates Email, Phone, & Text Alerts API Access	51+ Devices Data stored for life of account Multiple sample rates Email, Phone, & Text Alerts API Access

HUMAN MACHINES

> " **WHAT, THOUGH, WOULD HAPPEN TO THE TATTOO INDUSTRY IF THE BODY ART COULD RECORD MUSCLE ACTIVITY WITHOUT INCONVENIENCING THE PERSON WEARING IT?**

TATTOOS ARE QUICKLY GAINING POPULARITY in today's society. A survey conducted in 2016 reports that about three in ten Americans have at least one tattoo, but it doesn't stop there. Of those with any tattoos, seventy percent have at least two.

Tattoos come in many styles, including quotes, animals, symbols, or abstract designs. What, though, would happen to the tattoo industry if the body art could record muscle activity without inconveniencing the person wearing it? University of Illinois's Dr. John A. Roberts has developed such an option in the form of Electric Tattoos.

In 2008, Dr. Rogers founded MC10, an "electronics everywhere" company with the goal of creating electronics that had a more natural feeling. To do that he needed to make the technology conform to the human body and all of the squishy, bendable, hairy, and sweaty things that go with it. The how though, was always holding him back.

SILICON QUICKLY BECAME THE ANSWER. In order to make this technology stretchable and bendable, Rogers and his team arranged tiny silicon wires into coiling patterns and wove them through slender rubber patches. As these coils expand, they link all the functional parts of the device together including the sensors, antennae, and even their LED lights.

Yael Hanein, a professor of electrical engineering at Tel Aviv University explains, the "electric tattoo" is made up of three main parts: a carbon electrode, an adhesive surface that fastens the tattoo to the skin and a polymer coating that can

How Tattooed Electronics Could Change Everything

By Rachel Kellett

conduct electricity. They can monitor muscle, heart, and even brain activity. For example, let's say you needed to measure your vitals. You would apply a patch to your arm in the morning, and continue your day as normal. The patch would collect energy from the sun, read your vitals and then transfer the data back out to an external device. It would make the monitoring job a piece of cake. The potential, though, doesn't stop there.

MC10 has big ideas for these temporary tattoos. The first models only offered patch-to-computer data transfer, but Rogers' team continues to work on improved wireless transmission systems. Eventually, they hope to see them as active players in the rehabilitation process, and even integrated into prosthetic limbs. Imagine being able to control a prosthetic limb by just speaking to it.

IT'S AN INTERESTING IDEA, and could take the world of prosthetics to even newer grounds, which is impressive considering how technological they already are. We've already discussed that here in the past, when we spoke about how BioTech is impacting the lives of America's wounded warriors. In that piece we discussed how Ottobock, a company that develops prosthetics and technology related to it, had developed knees with microprocessors. Their website describes them in detail.

"The knee's internal computer (microprocessor) controls an internal fluid, which may be hydraulic or pneumatic. (It) monitors each phase of your walking pattern (your "gait cycle") using a series of sensors. The continuous monitoring and control of fluid allows the processor to make adjustments in resistance so you can walk more efficiently at various speeds and walk more safely down ramps and stairs."

Should this new electronic tattoo developments be added to the technology already found in prosthetics, mobility and motion will only continue to increase. It's hard to believe how much further they can go considering what Melissa Stockwell, the first female from the Iraq war to lose a limb in active combat and a bronze medalist in the paratriathlon in the Paralympics, already thinks of her life with prosthetics.

"I've been able to do more with one leg than I ever could have with two."

THIS IS ALL GREAT KNOWLEDGE TO HAVE, but how close are we, really, to making any of this happen? While, testing electronic tattoos within a video game has already show impressive results. In an example of its potential, a member of Robert's team placed an electronic device on his neck and spoke. The virtual game world responded as he commanded. It means the potential exists. Now, its success rests in the execution.

Ultimately, the capabilities that these electric tattoos have could lead to boundless possibilities, potentially even helping us blur, or even cross, the line between man and machine. Whether or not those androids come inked or not is still to be determined. **D**

*For images of these electronic tattoos or for a list of sources, please visit **DicksonData.com/Blog** and search for "Human Machines".*

*Have something personal you'd like to add to the conversation? Send us your thoughts to **jeff@dicksondata.com** for a chance to be featured in a future blog or magazine.*

There's No Reason to
Improve on the Best.
We Did it Anyway.

DSB

The newest member to the Dickson family.

Dickson's Display Loggers, one of our top annual sellers, have been fully redesigned to incorporate features from our best selling devices into non-connected units.

The logger will be able to collect all of the temperature and humidity data you've become accustomed to from Dickson's replaceable sensors. You can learn more about Replaceable Sensors on page 20.

Starting at $199, the DSB is now available to order! Visit **DicksonData.com/DSB** for more info.

TEMPERATURE SENSORS STARTING AT $110

- Single/Dual K-Theromocouple Temperature Sensor
- Single/Dual Temperature Thermistor Sensor
- Ambient Temperature & Humidity Sensor
- Platinum RTD Temperature Sensor
- Ambient Temperature Sensor

REPLACEABLE SENSORS

UPDATED DICKSONWARE

UP TO 2X THE BATTERY LIFE

MORE COMPACT DESIGN

Introducing **Legacy Uploader.**

View, analyze and export your data in a 21CFR11 compliant environment. Want to share your data with others throughout the company? Then manually upload all of your downloaded data to the **Dickson**One Cloud thanks to our new Legacy Uploader tool.

*For more details, visit **DicksonData.com/Uploader**.*

Get more out of **DicksonWare.**

Why go digital? **That's easy.**

DicksonWare now allows you to store and share data easily with others in your organization by uploading it to our cloud-based environmental monitoring system, **Dickson**One.

For more information visit DicksonData.com/DicksonWare.

ANALYZE YOUR DATA

View your temperature monitoring data historically, graphed in detail to allow you to pull insights and recognize any excursions as they occurred.

SIMPLIFY SHARING

Not only can you view temperature and humidity data on your phone, tablet, or computer, you can also grant data access to key employees through individual user logins.

VIEW YOUR DATA

Take your data with you wherever it's been uploaded. And, thanks to our new Legacy Uploader, you can save your data to the cloud to view on any connected device.

Want to know your facility better? **Leave it to us.**

TEMPERATURE MAPPING EXPERTS

LET DICKSON'S SKILLED PROFESSIONALS GET YOU UP TO DATE.

Temperature mapping your facility, warehouse, or equipment is a daunting task. We know, we've done it a lot. Dickson can help keep your business fully compliant, streamline your business operations, and protect sensitive products with our temperature mapping services.

PLAN OF ATTACK

We evaluate and decide where to place devices for a successful mapping.

MEET AUDIT REQUIREMENTS

Rely on our expertise to create reports that are defendable in an audit.

DICKSON CALIBRATED DEVICES

No 3rd party vendors here, saving you time and headaches.

WATCH WHILE WE WORK

We'll handle the process from start to finish so you don't lose time.

ENVIRONMENTAL INVESTIGATION

We're here to digest, analyze, and help you understand your facility and its data.


LET'S GET STARTED.

Once the mapping has ascertained where the points of temperature variation lie within a temperature controlled environment, then permanent monitoring can be installed so that owners and users can prove their adherence to the related health and safety standards.

CONTACT A SPECIALIST TODAY.

Intense temperature can put your audit at risk. Book your winter mapping study now to keep your assets from freezing.

630-563-4212

MILLIONS OF DATA POINTS
RIGHT IN YOUR POCKET
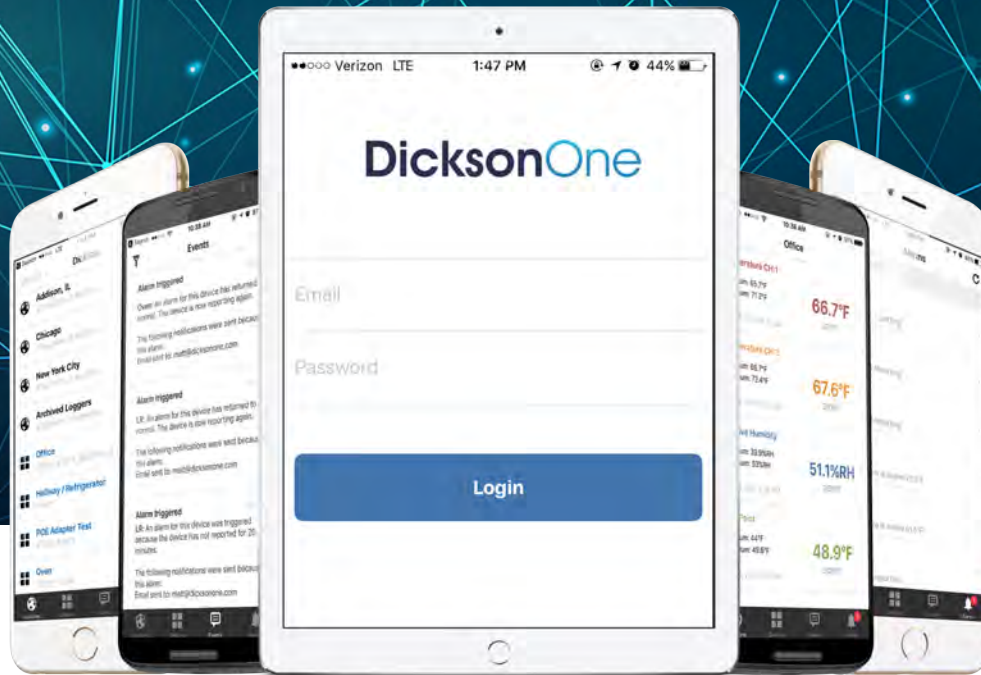
We know you're always on the move.
So we made sure your data could be, too.

With the **DicksonOne** mobile app, you can instantly access all
your data and location information in the cloud.
Anywhere. Anytime.

TRADE SHOW
RECAP

This month we're completing our annual journey to learn, teach, share, and grow at a variety of trade shows across America.

01 We learned about ongoing research done by the scientific community at **Pittcon** in **Chicago.**

02 We traveled to **Austin, TX** and learned about machine learning and advancements in healthcare at **South by Southwest.**

03 Our team traveled across the pond to **Bangkok** to see what's happening internationally with the cold chain.

04 The inaugural **Health Packaging Expo** last month let us get in front of customers in both manufacturing and pharmaceuticals.

05 Dickson traveled to the **American Association of Blood Banks** annual meeting to learn about transfusion medicine and cellular therapies.

06 While our roadshow calendar is always evolving, we're currently scheduled to visit **Interphex** in **New York** and hope to see many of you there.

Have a show you'd like to see us at? Let us know! We may not be able to make it, but we'll do our best to make a visit if possible.

*Have something personal you'd like to add to the conversation? Send us your thoughts to **jeff@dicksondata.com** for a chance to be featured in a future blog or magazine.*

VALIDATION SERVICES

SOLUTIONS
TO SUIT YOU

Why Dickson?

If you're in the quality assurance business like us, validation is a term you hear every day. "Validation" falls under the umbrella of terms businesses use to discuss the quality of their product, facility, or service. For those not well-versed in the world of quality assurance, hearing "validation" can send you running to hide under your desk. Luckily, Dickson offers validation services for our **DicksonOne** and **DicksonWare** software customers, also including temperature controlled equipment such as refrigerators, stability chambers, freezers, walk-in chambers, and much more.

IQ
INSTALLATION QUALIFICATION

TESTS
VERIFICATION OF CORRECT EQUIPMENT INSTALLATION

ENSURES
CORRECT INSTALLATION OF SYSTEM PER SPECS

ESTABLISHES
A BASELINE FOR EQUIPMENT

OQ
OPERATIONAL QUALIFICATION

TESTS
VERIFICATION OF CORRECT EQUIPMENT OPERATION

ENSURES
CORRECT OPERATION OF SYSTEM PER SPECS

VERIFIES
SYSTEM MEETS CLAIMS FROM PARAMETER

PQ
PERFORMANCE QUALIFICATION

TESTS
VERIFICATION OF CORRECT EQUIPMENT PERFORMANCE

ENSURES
CORRECT PERFORMANCE OF SYSTEM PER SPECS

VERIFIES
SYSTEM MEETS CUSTOMER'S INTENDED PURPOSE

**Is your company ready for a quotation or need more information?**
Contact a specialist today at 630.563.4212

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

MODEL	FEATURES	STARTING PRICE
KT6	6 Inch Temperature	$384
KT8	8 Inch Temperature	$436
TH6	6 Inch Temperature and Humidity	$509
TH8	8 Inch Temperature and Humidity	$509
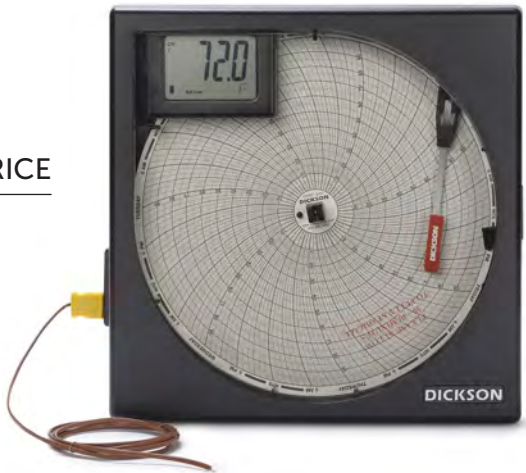
4 and 3 Inch Models

MODEL	FEATURES	STARTING PRICE
SL4350	4 Inch Temperature	$249
SL4100	4 Inch Temperature	$249
SC367	3 Inch Temperature	$249

Pressure Recorders

MODEL	FEATURES	STARTING PRICE
PW4	4 Inch Chart Recorder < 1000 PSI	$469
PW86	8 Inch Chart Recorder < 1000 PSI	$654
PW87	8 Inch Chart Recorder ≥ 1000 PSI	$779

Visit **DicksonData.com/products/find/pressure** for a full list of available pressure loggers.

DATA LOGGERS

—

For data loggers, information (temperature/humidity measurement and date and time) is stored as information. That data is stored in the device for later download (via software) onto a computer, or sent to a cloud application or server for remote access.

Indicators

TC700 Touchscreen Handheld Indicator ———— $299
Instant temperature data.
No-slip silicone cover. Battery powered.
Temperature Range: -200 to 1999°F, (-128 to 1093°C)

TH700 Touchscreen Handheld Indicator ———— $299
Instant temperature/humidity data.
No-slip silicone cover. Battery powered.
Temperature Range: -40 to 185°F, (-40 to 85°C)
Humidity Range: 0 to 95% RH (non-condensing)

High Temperature

HT300 Waterproof, High Temperature Data Logger —— $349
HACCP and FDA Compliant. USB Download. IP68 Rating.
Temperature Range: -40°F to 257°F, -40°C to 125°C
1 & 3 Point Calibration options available.

HT350 High Temperature Process Logger ———— $349
HACCP Compliant. K-Thermocouple Probe, USB Download, and a large temperature range.
Temperature Range: -40 to 257°F (-40 to 125°C)
1 & 3 Point Calibration options available.

Compact

SP125 ———————————————————— $119
Temperature Logger
Accuracy: ±1.2°F, ±.7°C
Range: -10°F to 176°F, -23°C to 80°C

TP125 ———————————————————— $199
Temperature & Humidity Logger
Accuracy: ±0.8°F, ±.44°C
Range: -10°F to 176°F, -23°C to 80°C
Humidity: +/-2% RH from 0 to 60%; +/-3% RH from 60 to 95%

SK550 ———————————————————— $699
Temperature Logger Pack of 12
Accuracy: ±1.8°F, ±1°C
Range: -4°F to 158°F, -20°C to 70°C

TK550 ———————————————————— $999
Temperature & Humidity Logger Pack of 12
Accuracy: ±1.8°F, ±1°C
Range: -4°F to 158°F, -20°C to 70°C
Humidity: ±2% RH from 0 to 60%; ±3% RH from 60 to 95%

Display

SP425 ———————————————————— $159
Data Logger with Large Display
Accuracy: ±1.2°F, ±.7°C
Range: -4°F to 158°F, -20°C to 70°C

TP425 ———————————————————— $249
Temperature & Humidity
Accuracy: ±0.8°F, ±.44°C
Range: -4°F to 158°F, -20°C to 70°C
Humidity: ±2% RH from 0 to 60%; ±3% RH from 60 to 95%

CONVENIENCE
IS KEY

ALL YOUR CALIBRATION DATA RIGHT ON THE SENSOR.

Now, you have the option to calibrate the sensor as opposed to the unit. Think of it like this: the Replaceable Sensor takes an environmental reading, and the data logger or chart recorder records that environmental reading. By splitting up the sensor from the data logger and chart recorder, we've created a plug and play device that will keep you in compliance and save you time and resources.
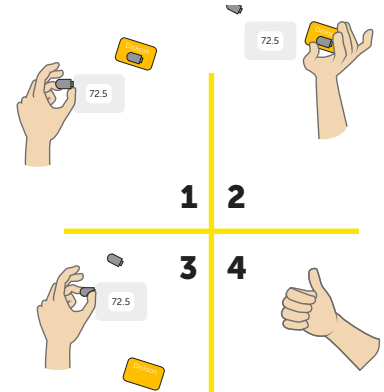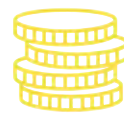
ZERO DOWN TIME

All Dickson sensors come pre-calibrated with upgrade and certificate options.

FAST & EFFICIENT

Pull the old sensor off. Put the new sensor on. It's that simple.

COST-EFFECTIVE

Back up units are no longer needed. Pay for a sensor, not an extra device.

GOING
DARK

By Jeff Renoe

KEEPING WARM during cold winter months can be a challenge in the best of times. When the cold becomes frigid it goes from being a challenge to a near impossibility. At least, that is, for those without heat or power.

AM I PREPARED FOR AN OUTAGE?

CHECK DOORS & WINDOWS

Make sure to keep all doors to the outside shut.

Use towels to block drafts coming in from window and door cracks.

Insulate windows with black blankets. The black draws heat from the sun. If the sun's beams are coming through the window, put the blankets on the floor where the sun is directly shining instead.

RUN A BATH

Running a bathtub of hot water also draws in heat to the house.

Keep in mind that without power, your water heater could be down. If that's the case hot water is limited.

THIS IS IMPORTANT TO CONSIDER, because according to the US Department of Energy, power outages are on the rise nationwide. According to the government the reasons are pretty cut and dry.

"An aging infrastructure, combined with a growing population and more frequent extreme weather, are straining the electric grid."

Another frightening statistic is that the five-year annual average of outages has doubled every five years.

2000 to 2004, there were an average of 44 reported grid outages per year.

2005 to 2009, there were an average of 100 reported grid outages per year.

2010 to 2013 (a four-year period), there were an average of 200 reported grid outages per year.

As the trend continues to climb, it's important to ask yourself the question, "Am I prepared for an outage?" In the winter, the most important thing is to stay warm. That's because, according to accuweather.com, temperatures indoors can plummet without ongoing heat. When that happens, though, **there are a number of things you can do to hold heat within your walls.** *(See sidebar)*

These are important factors, to be sure, but blackouts don't only affect people's homes. They also impact their businesses. Unfortunately, according to global corporate insurer Allianz, this is going to become a growing problem.

"Power cuts are becoming more and more frequent. Large-scale, supraregional blackouts are increasingly a realistic scenario. Even small outages can have disastrous effects on unprepared businesses."

What makes this even more concerning is that outages aren't always just a short downage. With an aging electrical grid, the outages could be much more damaging to a company's bottom line.

"While the majority of power failures from national grids last only a few hours, some blackouts can last days or even weeks, completely shutting down production at companies and critical infrastructures such as telecommunication networks, financial services, water supplies and hospitals."

While this article mentions outages causing downtime, what it doesn't mention is the real concern for lost assets. As many of our customers are well aware, a loss in refrigeration or a reliable climate control system could force companies to toss hundreds of thousands of dollars worth of product it can no longer guarantee is safe for public use and consumption.

THE FOOD INDUSTRY would be an easy example of where this could potentially be a major issue. The USDA does a great job of discussing the science behind temperature's impact.

"Bacteria exist everywhere in nature. They are in the soil, air, water and the foods we eat. When bacteria have nutrients (food), moisture, time and favorable temperatures, they grow rapidly, increasing in numbers to the point where some can cause illness. Understanding the important role temperature plays in keeping food safe is critical. If we know the temperature at which food has been handled, we can then answer the question, "Is it safe?""

While you may be familiar with the danger zone in food, that's temperatures between 40° and 140°F, you may be unfamiliar with just what that means. Again, the USDA is here to educate.

"Bacteria grow most rapidly in the range of temperatures between 40 ° and 140 °F, doubling in number in as little as 20 minutes. This range of temperatures is often called the "Danger Zone." That's why the Meat and Poultry Hotline advises consumers to never leave food out of refrigeration over 2 hours. If the temperature is above 90 °F, food should not be left out more than 1 hour."

Even with food well stored during a power outage, according to the Red Cross, if your freezer is half-filled and is not opened the entire time that the power is out, the food in it will remain sufficiently frozen for up to 24 hours. If it is completely filled, your food should remain safe for up to 48 hours.

"A SINGLE VACCINE REFRIGERATOR COULD HOLD UP TO $70,000 WORTH OF INVENTORY."

-New York Times, 2014

FOOD ISN'T THE ONLY INDUSTRY where ambient conditions are critical to its success. As many of our customers are well aware, the worlds of healthcare and pharmaceutical rely on temperature monitoring devices to not only remain compliant to industry standards, but to maintain standards that ensure their patients and customers safety. That's important, because, as a New York Times article stated in 2014, a single vaccine refrigerator could hold up to $70,000 worth of inventory. Leaving the viability of those drugs up to whether or not your local grid can maintain power is a dangerous, and potentially costly, proposition.

The BCG vaccine that is primarily used against tuberculosis, for example, becomes fully degraded after 48 hours at room temperature. That means that a single weekend away from the office could force a clinic or office to replace its entire stock if not properly monitored.

According to Dr. Lance Rodewald, the director of immunization services at the Center for Disease Control and Prevention in Atlanta, waste costs the $2 billion-a-year federal Vaccines for Children Program about $20 million a year. The biggest single cause? That would be improper refrigeration. Dr. Patricia Quinlisk, Iowa epidemiologist, echoed this sentiment.

"We will get months and months and months of vaccine refrigerator logs where the refrigerator is out of the temperature and nobody has done anything except every day mark down it's out of temperature," she said.

Power outages may not be the only cause of the losses, but they're a part of them. Should historical trends continue unchecked, blackouts will only cause these numbers to grow in the future. Preparing in advance can keep you, and your inventory, feel left out in the cold. **D**

Our cloud based monitoring system records data in real time and recognizes excursions because of things like blackouts or even when data isn't being collected because the power is down and local access to the cloud is unavailable. Visit DicksonData.com/ DicksonOne if you're interested in learning more about products that can alert you automatically via phone, text messaging, or email to better protect against lost assets during a blackout.

Have something personal you'd like to add to the conversation? Send us your thoughts to jeff@dicksondata.com for a chance to be featured in a future blog or magazine.

THAT MEANS THAT A SINGLE WEEKEND AWAY FROM THE OFFICE COULD FORCE A CLINIC OR OFFICE TO REPLACE ITS ENTIRE STOCK IF NOT PROPERLY MONITORED.

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