Topics

- Company Overview
- List of measurements
- Where loggers are used
- Data Logger Platform Overview
- Questions
Company Overview

- A World Leader in Data Loggers
- Founded in 1981
- 125 employees
- Over 2 million HOBO data loggers sold
Company Overview

- Sole business focus on data logging & monitoring
- Pioneered first under-$100 temperature logger – the original “HOBO”
- Manufactured in the USA
- Technical Support from 8AM to 8PM EST.
Onset Markets

Energy Management  Field Research  Water Management
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What is a Data Logger?

A measurement tool containing a microprocessor, memory and sensors for measuring and recording one or more variables over time.
“I just think the only way we are really going to get to the point we need to get to is to start collecting the real data.”

Garry Brown
New York Public Service Commission
Data-Driven Energy Management

- Rapidly deploy loggers wherever data is needed
- Quickly establish energy baselines
- Easily identify building performance issues
- Accurately verify cost-saving guarantees
- Take the guesswork out of energy management
## Data Logger Measurements

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Energy/Power</th>
<th>Time-of-Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>kW &amp; kWh</td>
<td>Light On/Off</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>Power Factor</td>
<td>Motor On/Off</td>
</tr>
<tr>
<td>CO2</td>
<td>AC/DC current</td>
<td>State changes</td>
</tr>
<tr>
<td>Air velocity</td>
<td>AC/DC voltage</td>
<td>Occupancy/Light</td>
</tr>
<tr>
<td>VOCs</td>
<td>Differential pressure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gauge pressure</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Water/Moisture</th>
<th>Weather</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water temperature</td>
<td>Temp/RH</td>
<td>4-20mA signals</td>
</tr>
<tr>
<td>Water level</td>
<td>PAR</td>
<td>Pulse signals</td>
</tr>
<tr>
<td>Conductivity</td>
<td>Light intensity</td>
<td>0-24V signals</td>
</tr>
<tr>
<td>Salinity</td>
<td>Rainfall</td>
<td></td>
</tr>
<tr>
<td>Water flow</td>
<td>Wind speed &amp; direction</td>
<td></td>
</tr>
<tr>
<td>Soil Moisture</td>
<td>Solar radiation</td>
<td></td>
</tr>
<tr>
<td>Leaf Wetness</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Common Uses for Data Loggers

- Renewable energy systems monitoring
- Occupancy comfort monitoring
- HVAC systems monitoring
- Doors open/closed
- Water use monitoring
- Equipment Scheduling
- Building Commissioning
- Demand Response
- Green Roof performance
- Site-specific weather monitoring
- Light/Occupancy Monitoring
- Power monitoring
Topics

• Company Overview
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• **Data Logger Platform Overview**
• Questions
Data Logger Platforms
How do you want to get your data?

**Standalone Data Loggers**
Short-term trend logging with manual offload

**Wireless Sensors**
Short-range centralized data collection

**Web-Based Systems**
Long-range wireless Internet access
Data Logger Software
HOBOware Graphing & Analysis

- Easy and fast logger set up for all HOBO data loggers
- Quickly batch-configure and readout hundreds of loggers
- Presentation quality graphics
- View data in graph and/or tabular form
- Easy file management
- Simple export to MS Excel
- Windows & Macintosh compatible
Data Logger Platforms

Standalone Data Loggers
Short-term trend logging with manual offload
Standalone Data loggers

- Simple and quick to deploy
- Inexpensive
- Highly portable and reusable
- Internal and external sensors
- LCD for visual feedback
- Larger memory for longer deployments/fewer site visits
- Measurements:
  - Temperature & Temp/RH
  - Time-of-Use (lights/occupancy/motors)
  - Energy/Power
NEW – Plug Load Data Logger

• Compact, Rugged Design
• 8-logged data channels (TRMS Volts, TRMS Amps, Watts, kWh, VA, VAR, PF and battery)
• User-selectable Min, Max, Average Statistical Logging
• LCD Display with Lexan protective window
• “Meter Mode”
  – Displays real-time variables when not logging data
  – Resettable energy-usage meter (in kWh) on the LCD.
• Battery powered when not connected to mains
• 1 Watt Resolution at < 1%
• 4 Mbytes of internal storage (1.4 million measurements)
• 6.99kHz chip sampling rate

Available in July
< $250
Reducing Compressed Air Waste

Stand-alone Data Loggers - Case Study

Challenge:

• Identify leaks in compressed air systems in industrial plant
• Compressed air used for all production equipment
• Reduce energy waste from three 1,250-horsepower compressors that run 24/7
• Complex leakage monitoring systems are costly
Reducing Compressed Air Waste
Stand-alone Data Loggers- Case Study

Solution:
• Multi-channel HOBO loggers tracked individual production tools to pinpoint problems
• Compressed air flow meters connected to logger to measure cubic feet per minute (CFM)
• HOBOware and Excel data analysis of anomalies in the system
Results:

• Loss of 20 to 30 CFM discovered due to leaks
• Worst compressed air leaks identified and repaired – producing a 10 CFM decrease in waste
• Facility saved $2.24 for every CFM of High Pressure air
• Also identified over-cycling which can shorten equipment lifespan
• HOBO loggers now a standard operating procedure at the plant
Data Logger Platforms

Wireless Sensors
Short-range centralized data collection
Wireless Sensor Networks

HOBO ZW Series

- Wide Range of Measurements
- Scalability – 100 nodes/network
- Self-Healing Network
- More than a sensor
  - Onboard Buffer Memory
- Alarm capabilities
- Advanced network management software
Network System Components

<table>
<thead>
<tr>
<th><strong>Data Node</strong></th>
<th><strong>Router</strong></th>
<th><strong>Receiver</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Records data measured by internal and external sensors</td>
<td>• Provides connectivity to other nodes</td>
<td>• Central hub to collect and store data</td>
</tr>
<tr>
<td>• Battery Powered – 1 yr @ 15 min logging interval</td>
<td>• Range extenders that expand the reach of the wireless network</td>
<td>• Bridge between network and software</td>
</tr>
<tr>
<td>• Dual purpose Data/Router node when AC powered</td>
<td>• Always AC powered with battery backup</td>
<td>• Stores network information and sends commands to nodes</td>
</tr>
<tr>
<td>• Either dedicated routers or Data Nodes acting as Data/Router nodes</td>
<td></td>
<td>• AC powered or USB with battery backup</td>
</tr>
</tbody>
</table>

NCBC
How does it work?

ZW-008
Power & Energy Measurements

ZW-007
Temp, RH & CO2

ZW-003
Temp and RH

ZW-005
Temperature and Water flow

ZW-006; External sensors to reach remote points

Obstruction

ZW-001
Temperature

Computer
Receiver
Data Node
Router
Dual Purpose

NCBC
Software
HOBONode Manager

- Utility within HOBOware Pro
- Easy network setup and monitoring
- Near real-time graphing
- Easy alarm set up
- Network Map feature for visual representation of all nodes and network connections

➢ Requires a computer capable of running HOBONode Manager
Software
HOBONode Manager

• Alarms
  – Easily configure both sensor and system alarms
  – Get notified via text messages, email

• Automated Data Delivery
  – Data forwarded to FTP site or email address at regular intervals
  – CSV format: Easy integration with 3rd party programs
  – HOBOware format: Analyze data on other machines running HOBOware Pro
Challenge:

- Reduce energy use in 800,000 sq. ft. warehouse
- Collect data for $1M proposal to replace lights
Solution:

- HOBO wireless data nodes installed to measure AC current, temp, and RH
- Nodes mounted at a 13-foot height to achieve a 300-foot transmission range
**Lighting System Audit**

**Wireless Data Nodes - Case Study**

**Results:**

- Centralized collection of data from multiple points
- Scalable network across large facility
- No interference with other RF signals used at the facility
- Plans for future HVAC monitoring with wireless nodes
Data Logger Platforms

Web-Based Systems
Long-range wireless Internet access
Data Logger Systems
Web-based Monitoring Systems

- Remote monitoring systems with cellular/Wi-Fi/Ethernet communications
- Versatile platform – use for indoor energy monitoring, or outdoor weather monitoring
- Rapid deployment
- Wide range of plug-and-play sensors
- Alarms via text, email
Software

HOBOlink Web-based Display/Readout

• Remote system management capabilities
  – Set up and manage alarm notifications over the web
  – Schedule automated delivery of exported data files
  – Analyze data faster with custom export capabilities

• Web Services interface
  – Direct Data Access or Third Party Energy Monitoring Software
Web Monitoring

Direct Data Access or Third Party Energy Monitoring Software

- Seamless data integration with custom software applications
- Supports the Simple Object Access Protocol (SOAP) and Representational State Transfer (REST) architecture
- Data can be fetched through the web services either in CSV format or SensorML (Sensor Model Language) format
The Convenience of Web-Based Monitoring

The DECK Dashboard

The Energy Intelligence Admin Panel
How DECK Monitoring Works

DECK software can monitor virtually anything you can meter!

The DECK monitoring solution can stand alone with your building submetering, or integrate with any existing building automation system.

The Gateway is a hardware device that receives data in virtually any protocol, then prepares that data for internet compatibility.

If you are unable to get a local internet connection at your facility, we can provide a cellular internet modem.

Your data is sent to DECK servers, then to your personalized Dashboard and Admin Panel web pages... all in real time!
Building Commissioning with the U30

- 5 U30 WiFi
- 45 kWh transducers
- **Short Term Goals** –
  - reduce overall energy costs
  - Projected $125K saving in year 1
- **Long Term Goal** –
  - Create an energy challenge
  - Bill departments for energy use
  - Implement Dashboard
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Onset Data Logger Summary

• Broadest range and most flexible data logging tools for short-mid term auditing & commissioning applications.

• Short range wireless networks to centrally monitor various parameters at numerous measurement locations.

• Long range wireless monitoring systems for real time remote internet data access.
Support & Training

- www.onsetcomp.com
  - Application Stories
  - Application Solutions
  - Case Studies
- Youtube.com/hobodataloggers
- Monthly Webinars
- Online Chat & Phone Support
  - 8am – 8pm EST
Questions

Thank you!
Scott Ellis, Product Marketing Manager

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