iButtons

Sensing the environment
and beyond…

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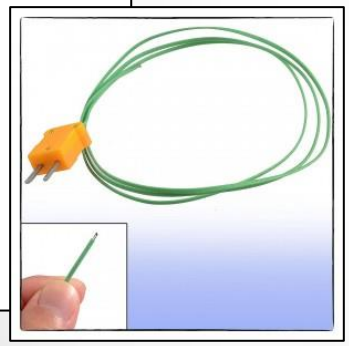
2014

TIPO DE SENSORES

SOLO REGISTRAN

- ✓ TERMÓMETROS DIGITALES

TERMOCUPLA TIPO K



- ✓ SENSORES IR (INFRA-ROJOS)

REGISTRAN Y GRABAN

- ✓ DATA LOGGERS

TIPOS DE DATA LOGGERS

APLICACIONES DE LOS DATA LOGGERS

Data logger application for weather station

Applications of data logging include:

- Unattended weather station recording (such as wind speed / direction, temperature, relative humidity, solar radiation).
- Unattended hydrographic recording (such as water level, water depth, water flow, water pH, water conductivity).
- Unattended soil moisture level recording.
- Unattended gas pressure recording.
- Offshore buoys for recording a variety of environmental conditions.
- Road traffic counting.
- Measure temperatures (humidity, etc.) of perishables during shipments: Cold chain.[1]
- Measure variations in light intensity.
- Process monitoring for maintenance and troubleshooting applications.
- Process monitoring to verify warranty conditions
- Wildlife research with pop-up archival tags
- Measure vibration and handling shock (drop height) environment of distribution packaging.[2]
- Tank level monitoring.
- Deformation monitoring of any object with geodetic or geotechnical sensors controlled by an automatic deformation monitoring system.
- Environmental monitoring.
- Vehicle Testing (including crash testing)
- Motor Racing
- Monitoring of relay status in railway signalling.
- For science education enabling 'measurement', 'scientific investigation' and an appreciation of 'change'
- Record trend data at regular intervals in veterinary vital signs monitoring.
- Load profile recording for energy consumption management.
- Temperature, Humidity and Power use for Heating and Air conditioning efficiency studies.
- Water level monitoring for groundwater studies.
- Digital electronic bus sniffer for debug and validation

http://en.wikipedia.org/wiki/Data_logger

- Temperatura
- Temperatura y humedad
- Temperatura, humedad y presión absoluta

What is an iButton?

Is a **computer chip** enclosed in a 16mm thick stainless steel can, which acts as an electronic communication interface.

One side = data contact lid
The other side = the base

connected to the silicon chip inside

Set up and download data

* Touch the iButton to the 1-Wire interface device
* Run OneWire Viewer program

Advantages

size, durability, data capacity, variety of models, low cost

High durability

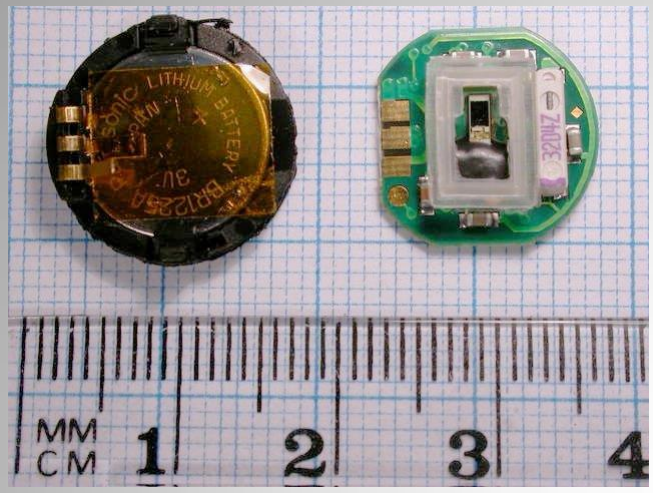
- Stainless steel can
- The iButton is wear-tested for 10-year durability against dirt, moisture, and shock
- Wide temperature range tolerance

Data Capacity, Variety Models and Low Cost

DS1920 Thermometer Temperature range between -55°C and +100°C and 0.5°C resolution From U$D 8.95	**DS1921G** Temperature range between -40°C and +85°C with medium sized memory up to 2000 samples From U$D24.85	**DS1922L** Temperature range between -40°C and 85°C with high memory capacity up to 4096 samples From U$D50.00
DS1922T Temperature range between 0°C and +125°C with high memory capacity From U$D73.50	**DS1922E** Temperature range between 15°C and +140°C with high memory capacity From U$D93.50	**DS1923** Temperature and relative humidity measurement. Temperature from -20°C to +85°C From U$D93.50

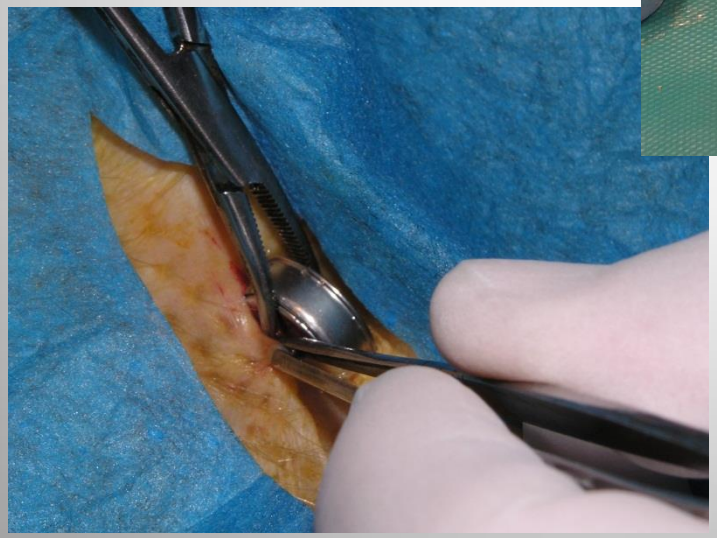
Costos en 2013

Small size



Applications

Within food storage or transport, microhabitats in nature, biophysical models, even within living animals, to store electronic cash for small transactions, such as transit systems, parking meters



Fotos piches- cortesia de la Dra. Mariella Superina

Temperatura operativa (To)

Armamos los modelos de cobre con i-Buttons
(mini data-loggers)

Calibramos los modelos

Colocamos los modelos de a pares, uno en superficie y otro en grieta.

Registrarán y grabarán la temperatura con la frecuencia que le programemos

Calculamos

- la precisión de termorregulación: "**db**" =aproximación temperatura corporal al rango de temperatura selecta de la especie
- la "**de**" =aproximación de temperatura operativa a la Tsel
- **la eficiencia de termorregulación (E= 1- (db/ de)**
- **La calidad térmica del micro-hábitat = temperaturas registradas por los modelos nulos**

Setting up and Downloading data

Plug in the device to the PC

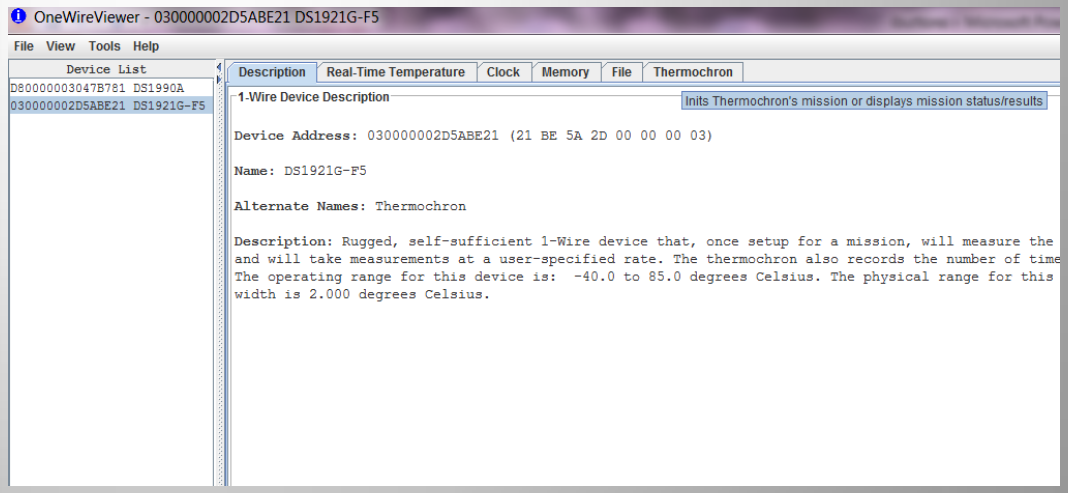
Open ‘One Wire Viewer EXE’ Program

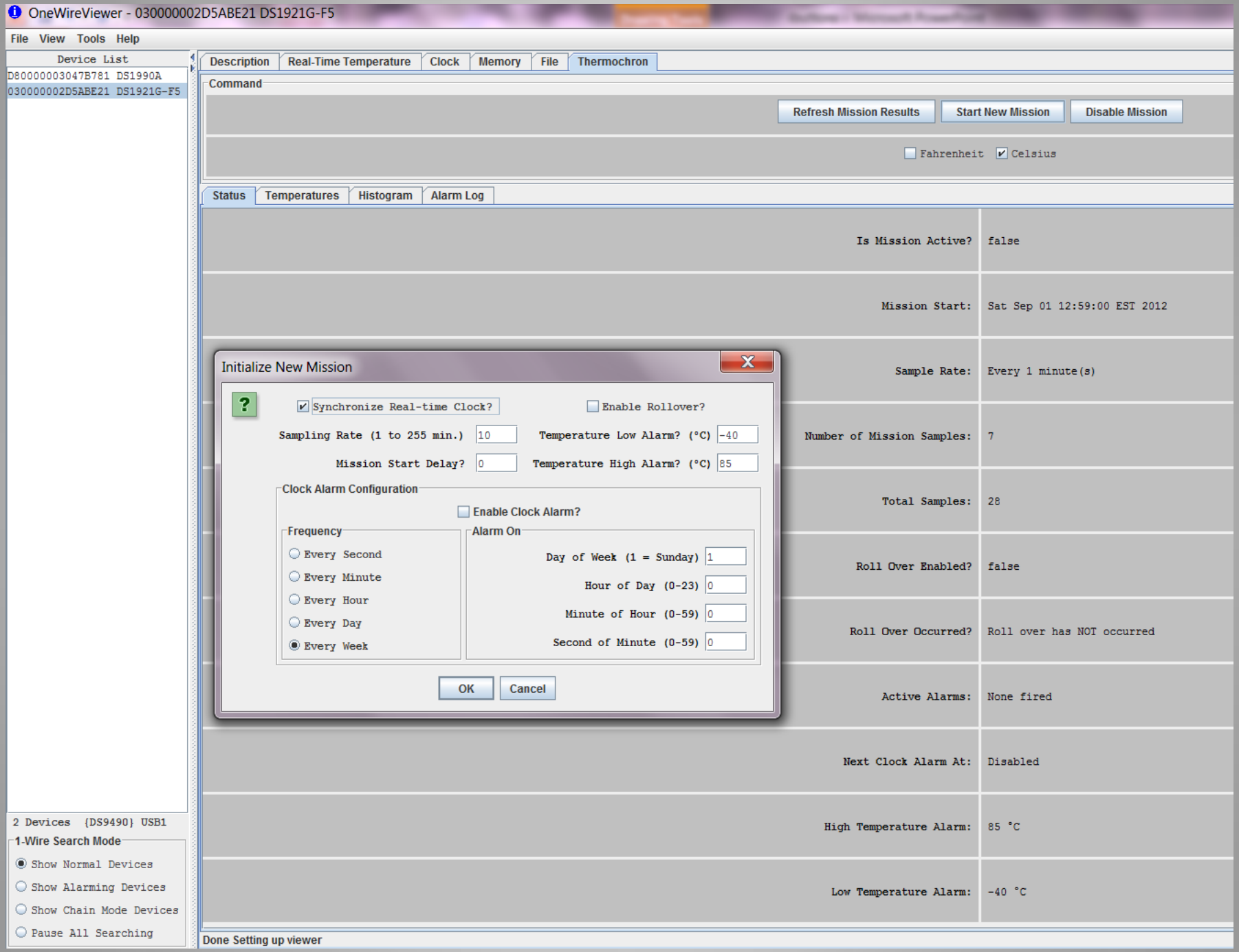
Connect an iButton on the device

The Script on the left shows you the series number for the device and the series number for the iButton below.

Click on the iButton series number-

Go to Thermochron lap




OneWireViewer - 030000002D5ABE21 DS1921G-F5
File View Tools Help
Device List
D80000003047B781 DS1990A
030000002D5ABE21 DS1921G-F5
2 Devices {DS9490} USB1
1-Wire Search Mode
Show Normal Devices
Show Alarming Devices
Show Chain Mode Devices
Pause All Searching
Description
Real-Time Temperature
Clock
Memory
File
Thermochron
Command
Refresh Mission Results
Start New Mission
Disable Mission
Fahrenheit
Celsius
Status
Temperatures
Histogram
Alarm Log
Is Mission Active? false
Mission Start: Sat Sep 01 12:59:00 EST 2012
Sample Rate: Every 1 minute(s)
Number of Mission Samples: 7
Total Samples: 28
Roll Over Enabled? false
Roll Over Occurred? Roll over has NOT occurred
Active Alarms: None fired
Next Clock Alarm At: Disabled
High Temperature Alarm: 85 °C
Low Temperature Alarm: -40 °C
Initialize New Mission
Synchronize Real-time Clock?
Enable Rollover?
Sampling Rate (1 to 255 min.) 10
Temperature Low Alarm? (°C) -40
Mission Start Delay? 0
Temperature High Alarm? (°C) 85
Clock Alarm Configuration
Enable Clock Alarm?
Frequency
Every Second
Every Minute
Every Hour
Every Day
Every Week
Alarm On
Day of Week (1 = Sunday) 1
Hour of Day (0-23) 0
Minute of Hour (0-59) 0
Second of Minute (0-59) 0
OK
Cancel
Done Setting up viewer

Start New Mission:
Click “Synchronize with PC time clock”

Unclick “Enable Rollover”: because it will overwite the recorded data when it runs out of space.
Besides, it will run out of batt since it will keep on recording all the time.

Sampling Rate: sampling frecuency

Start Delay: si quiero que empiece a grabar más tarde, sino empezaría a grabar desde que pongo “ok” el set up.

Click “Enable Sampling” (button not present in every device)

Unclick “**Enable Alarm**”

Resolution: bigger number-mas resolution-mas batt consumption

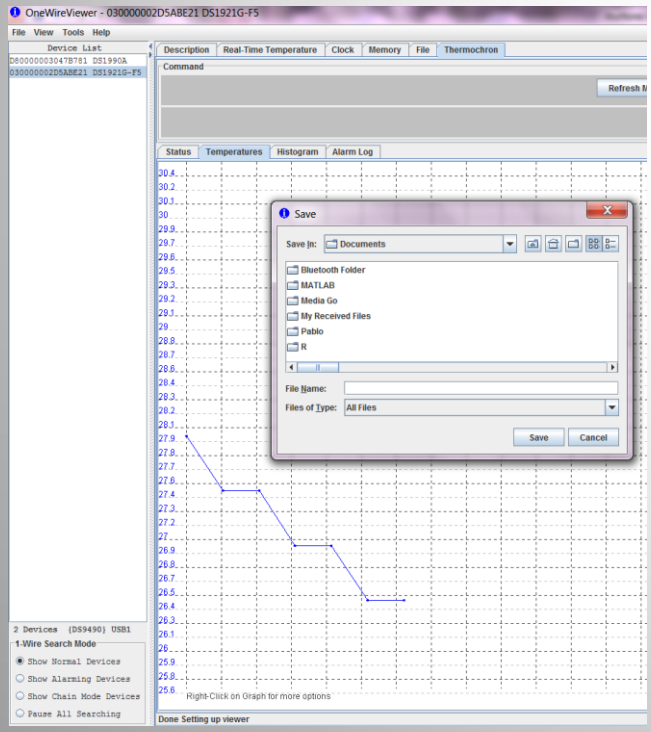
Click “Use-1-Second Mission Test”: to see whether it is working. (Also, ”Refresh Mission” will tell you whether it is working after you downloaded data)

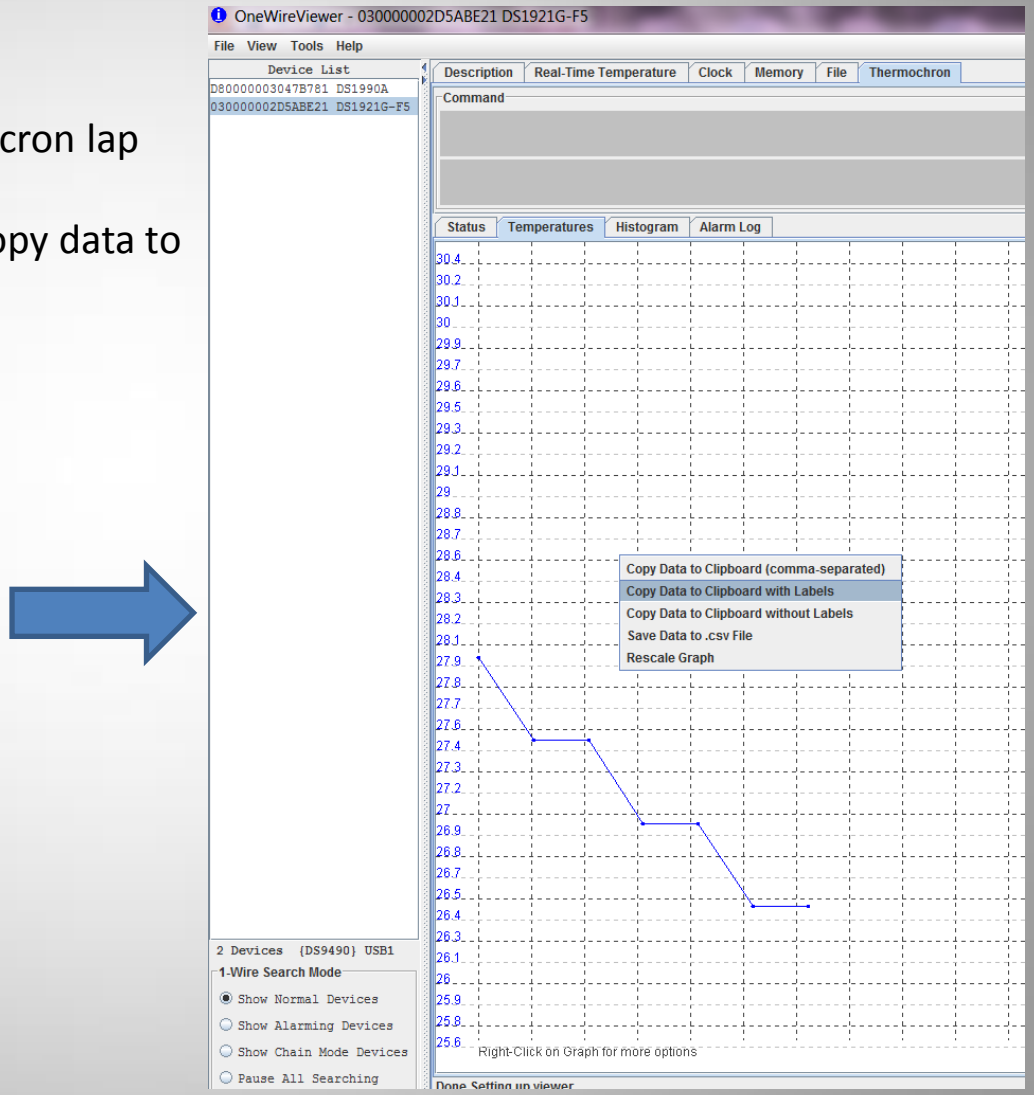
Press “OK” and it will start working when you detach the ibutton from the device.

Under "Status": you see all the parameters.
"Mission in Progress=false": If it ain't recording.
Under "Temp Data Log": plot the curve of recorded data
Disable Mission: will stop recording

To Export data to Excel:
Right click on the plot under Thermocron lap

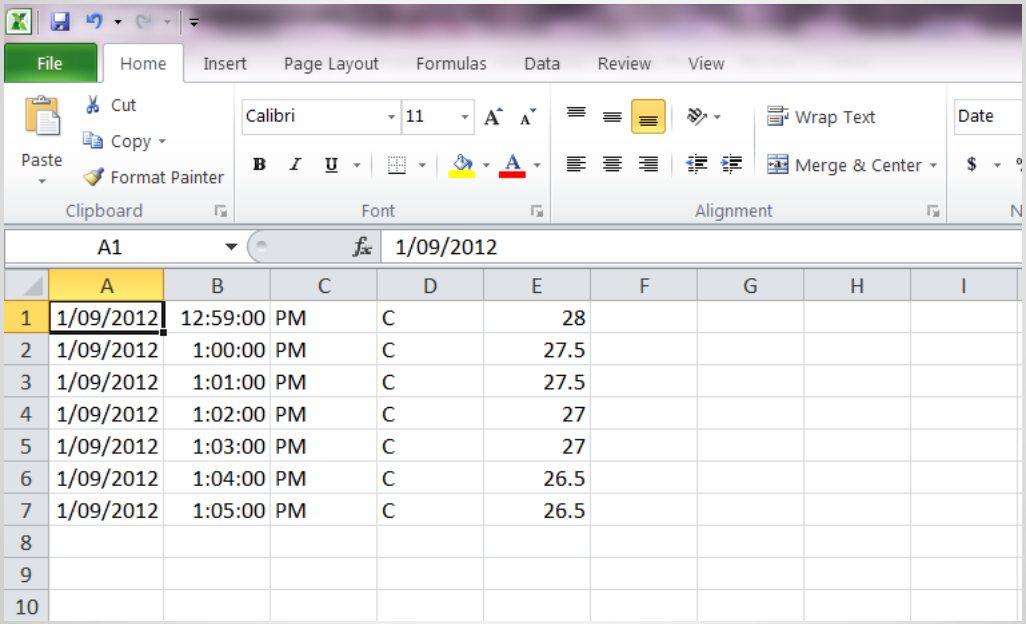
Choose "save data to…" and then "copy data to clipboard with labels"





Open Excel- “paste”- click ctrl- “use text import wizards” delimited-next-comma-next-finish

If I want to reuse that iButton, with the same set up: you must set it up all over again.



	A	B	C	D	E	F	G	H	I
1	1/09/2012	12:59:00	PM	C	28				
2	1/09/2012	1:00:00	PM	C	27.5				
3	1/09/2012	1:01:00	PM	C	27.5				
4	1/09/2012	1:02:00	PM	C	27				
5	1/09/2012	1:03:00	PM	C	27				
6	1/09/2012	1:04:00	PM	C	26.5				
7	1/09/2012	1:05:00	PM	C	26.5				
8									
9									
10									

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