1-Wire Temp Monitoring System

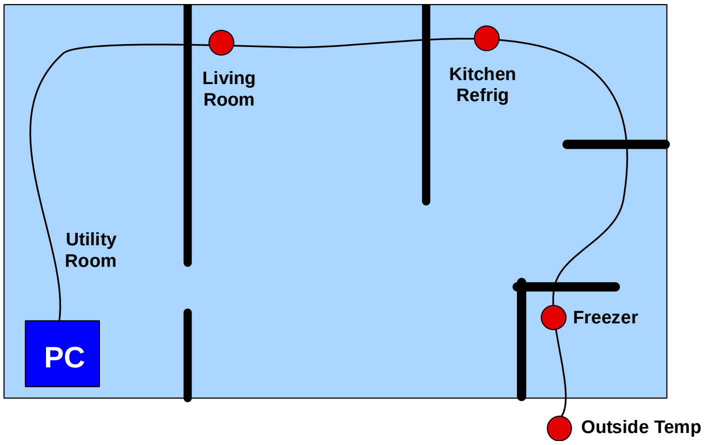
INTRODUCTION

The 1-wire network gets its name from the fact that only 1 wire is required to transmit information. It might still need up to 2 extra wires (for a total of 3) for power and ground, but it keeps the number of wires quite low, which can be very useful when the 1-wire components are used on PCB such as cell phones and small electronics devices.

1-wire devices can be more than temperature sensing. There are (low power) switches, counters, RAM , clock, thermocouple interface, and other devices adapted for special purposes, such as a battery meter turned solar radiation meter.

A very interesting feature of the 1-wire network is that most of its devices can be multi-dropped. This allows one to run a single cable from the PC interface passing through all the rooms in a home and finishing the run outside to get outdoor temperature.

Those devices, the temperature probes, are very cheap, something like $2.00 each. My cabling of choice is CAT3, 2 unshielded twisted pairs telephone cable, which is also quite cheap, in the order of $0.12 per foot. The rumor has it that you can pull about 300 feet of cabling per segment. Some extra devices allow you to have multiple segments deployed. You need a BIG house to go over the limits.



As far as the sensors themselves are concerned, the precision is not that much (all being relative!), and varies from probe to probe, and you will often see 0.5 to 1 Celsius of variation between sensors located within 2 inches one from the other. Note that if you buy a $10 (made-in-china) digital thermometer, you might get variation equal to or greater than that. You could get more precise probes, but they cost around $20 each.

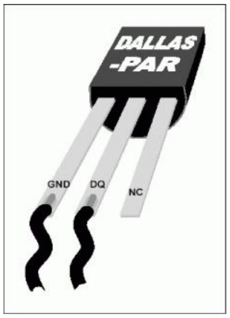
More details about the whole subjects is available from the Dallas / Maxim (Dallas was bought a few years ago) web site at http://www.maxim-ic.com/products/1-wire/

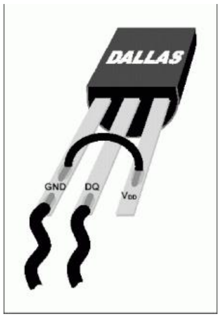
Getting Started: Obtain the interface for the PC. The Maxim DS9490R USB to 1-Wire interface is the most compact option and also highly compatible with virtually all computers.

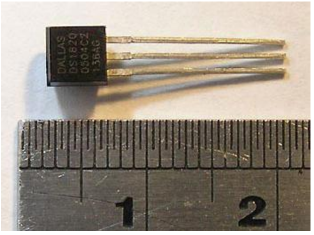
It is available for $14 from the Maxim web site.

MAXIM USB to 1-Wire Adapter

For temperature sensing the Maxim DS18B20-PAR seems the clear choice compared to the older style DS18B20. The difference between them is that the "PAR" version, which came later, only needs 2 wires soldered / connected, while the DS1820 needs a jumper wire soldered across two pins at each sensor to capture power off the data line. Clearly the "PAR" is much simpler to stick around a multi-drop wire run, as this "jumper" arrangement is already built into its internal construction!







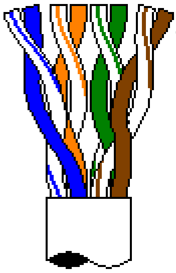
DS18B20-PAR by Centimeter Ruler

Even though only a single pair of wires is needed for the entire network, for cabling I used a simple CAT3 twisted pair unshielded cable containing 3 pairs of wires. This “Telephone and Computer Networking Cable” is available from Lowes hardware stores in 250 foot spools at a reasonable price. I used RJ11-6 crimp connectors and inserted all the cable wires for maximum (mechanical) strength.

"CAT-3" is a nickname for cable with four wire pairs that each meet the "Catagory 3" specification for data communications. The specification defines the conductor size, insulation quality and wire twists, plus a multitude of performance characteristics. In theory, all CAT-3 cables perform the same, supporting data transmissions up to 10MB/s or less.

CAT-3 cables have 4 wire pairs, making a total of 8 wires. Each pair is twisted to reduce signal interference. The biggest factor between the category specifications is the number of twists per linear unit. The more twists, the greater the signal integrity. Data signals are sent over the wire using a differential method. With tighter twists, any interference received by the cable is more likely to affect both wires in a pair equally, resulting in no change in the difference between them. This allows greater data capacity over longer distances. The tighter twists also suppress noise created by the cable because the magnetic field from one wire is canceled by its mate, making it less prone to interfering with other cables. When terminating data cables (with crimp-on connectors or at punch-down terminals), it is important to untwist the pairs as little as possible (1 cm. max.). Some ill effects of tighter twists is they make the cable more stiff and brittle.

CAT-5 Wire Pairs



The four wire pairs in a CAT-3 cable are distinguished by the color of their insulation. The four colors are (in order) blue, orange, green and brown. Thus, when refering to the "second pair" of wires, it is the orange pair. Regular phone cable consists of two untwisted pairs, each with wires of a different solid color (the first pair is Green/Red, the second is Black/Yellow).

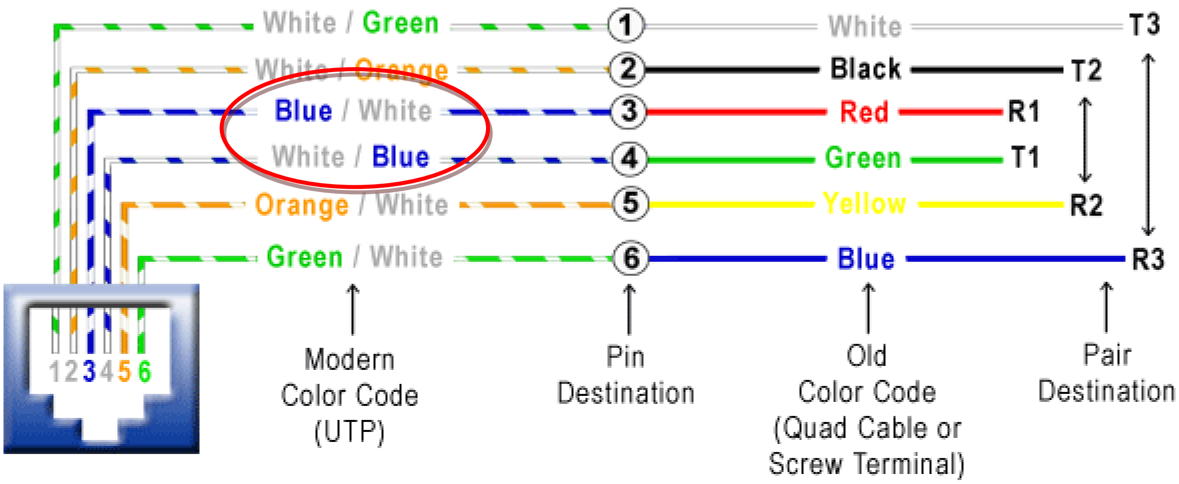
Strictly speaking, each colored pair consists of (in order) a white wire with a colored stripe and a colored wire with a white stripe. However, the rules for cables with so few pairs are lax. Most often you will find the pairs consisting of a white wire with a colored stripe and a solid colored wire. Sometimes the white wire may not even have a stripe (it may have dots or just be associated by the color of the wire it's twisted with), and sometimes it's not even white (being gray or transparent). Some cable has all solid colors in untwisted pairs (avoid completely as it is not CAT-3 rated). We will use the common white-striped/solid scheme throughout this site.

The table at right shows the order of the wire pairs. The color standard covers cables with more than four pairs, but that is out of the scope of this discussion.

CAT-5 Wire Order

Pair #	Wire Color	Abbr.	Wire # (Pair)	Wire # (Cable)
1	White/Blue	W/B	1	1
	Blue	B	2	2
2	White/Orange	W/O	1	3
	Orange	O	2	4
3	White/Green	W/G	1	5
	Green	G	2	6
4	White/Brown	W/Br	1	7
	Brown	Br	2	8

Usually the primary dial tone or talk circuit is wired to the center two pins (pins 3 & 4) and is the white/blue and blue/white pair (AKA: T1 & R1 - tip 1 and ring 1). A standard single line phone draws dial tone from these center pins.



Pair 2 (T2 & R2)

The secondary circuit is wired to the two pins (pins 2 & 5) directly to the side of the center pins and is the white/orange and orange/white pair (AKA: T2 & R2 - tip 2 and ring 2). Depending on the application, the secondary circuit can either be the 2nd dial tone line on a two line phone, or the data/control circuit for an electronic key phone.

Pair 3 (T3 & R3)

The third circuit is wired to the two pins (pins 1 & 6) on the outside and is the white/green and green/white pair (AKA: T3 & R3 - tip 3 and ring 3). Depending on the application, the third circuit can either be the 3rd dial tone line on a three line phone or an accessory circuit for an electronic key phone.

For mechanical strength I used 3 or the 4 pairs into a RJ11 connector, and pulled back and wrapped the unused white/green pair.

I used the **white/blue** wire for ground and the **blue** wire for data/power.

INSTALLING THE SOFTWARE

Communication with 1-Wire devices is done over a single data line, plus ground reference, using the 1-Wire protocol. The network is called 1-Wire Net or MicroLAN. 1-Wire adapters are available for serial, parallel and USB ports. Serial port adapters based on the DS2480B chip are common to all supported platforms. For Windows (32-bit) there are additional 1-Wire adapters for the serial, parallel, and USB port.

To use the 1-wire devices, drivers for the Maxim USB adapter must be installed as detailed below. After installing the drivers, the network may be tested using the Maxium 1-Wire Viewer, or may be directly used by installing the LogTemp data capture and charting Application.

OneWireViewer is not an executable image compiled for a specific platform. Instead, it is written in Java Programming Language. The compiler generates a binary code that is portable to different platforms for which a platform-specific interpreter or Runtime Environment (RTE) exists. The presence of the RTE on the computer is a precondition for the OneWireViewer to run. The RTE can be downloaded for free from the java.sun.com website. As "pure Java" it doesn't include drivers to access a hardware communication port. Such drivers, also referred to as "native Java", can be downloaded from the www.rxtx.org website. They are available for several operating systems and support the serial port.

> *The OneWireViewer is a Java-based software package used to explore Dallas 1-Wire devices using different hardware- and software platforms. This SW is useful for initial testing of the network but the Viewer is not used in actual operation as the LogTemp Application is run instead. This intro is given for informational purposes only and can be ignored if only the LogTemp Application is to be Run.*

The OneWireViewer is a "living software package", i. e., there may be updates at any time without special announcement. To ensure that the user always works with the latest version, the OneWireViewer is designed to be launched through Java Webstart, a special mechanism that is included in the Java 2 RTE, Revision 1.4.x and higher. If Webstart has internet access enabled, it will access the www.ibutton.com website and download updates to the OneWireViewer if there are any available.

Application	OneWireViewer
Launcher	Java Webstart (included in Java 2 RTE Revision 1.4.x and higher)
Engine	Java 2 Run Time Environment Revision 1.3.x or higher (Revision 1.4.x recommended)
Platform	Windows Linux 2) Solaris, etc. 3)
1-Wire Port	Serial, Parallel, USB Serial Port 1) Serial Port
Port Driver	TMEX Revision 3.21
Source	www.ibutton.com
Installation	manual

See “AN3358 [1wireviewer UserGuide]” in \\MEDIA-CENTER\Documents\#Software\HomeAutomation\1-Wire Temp Network\Maxim for more detailed information of Viewer.

MAXIM DRIVERS

Before installing the TMEX native 1-Wire drivers, **Remove** any previous version with the uninstaller.

1. Select the ***iButton-TMEX (32-Bit) VX.XX*** or ***1-Wire Drivers (Win32)*** line in the Add/Remove Programs.
2. Click OK at the bottom of the Add/Remove Programs window
3. When asked if you want to **Remove Shared File**, click ***Yes To All***.

Close any open application and direct your web browser to . . .
www.maxim-ic.com/products/ibutton/software/tmex/index.cfm

Click on the "Click to go to Download Page” button and select the appropriate OS and file. Download and Save them.

install_1_wire_drivers_x86_v402beta.msi

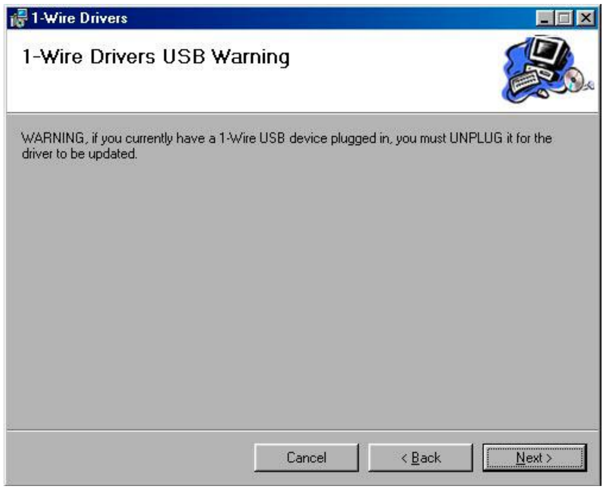
Then Run the Installer, but . . .

BEFORE RUNNING THE INSTALLER, MAKE SURE THE MAXIM USB 1-WIRE ADAPTER IS UNPLUGGED.

THIS IS IMPORTANT!

After the Software License Agreement is accepted, several more screens will follow. During the installation you can move from screen to screen by clicking on the button “Next >“ or “< Back” or cancel the installation (“Cancel”).

The next screen displays a USB Warning. Follow the instructions to unplug the 1-wire USB interface, and then click on **Next >** to continue.



1-Wire Drivers USB Warning

WARNING, if you currently have a 1-Wire USB device plugged in, you must UNPLUG it for the driver to be updated.

In the next step you need to specify the destination folder for the drivers and related documents. The default folder is

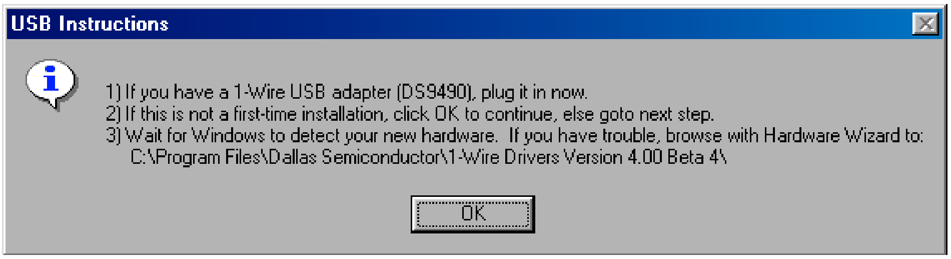
\Program Files\Dallas Semiconductor\1-Wire Drivers Version xxxx

on the Windows drive.

After the installation folder is specified or the default is accepted, click on **Next >** to continue. You will get to a Confirm Installation screen on which you need to click on **Next >** to launch the installation.

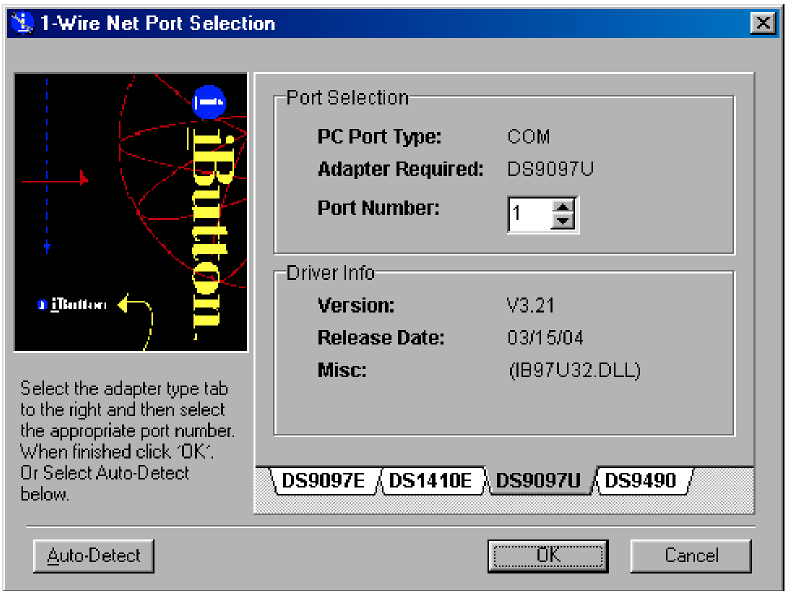
Besides installing the 1-Wire drivers in the installation folder the installer also creates a folder "1-Wire Drivers" on the Windows drive in \WINDOWS\Start Menu\Programs\ with shortcuts to the Default 1-Wire Net, ReadMe.htm, OneWireAPI.NET_Setup.msi, and OneWireViewer.htm. You can move any of the shortcuts to the desktop for convenient access. **Default 1-Wire Net** points to **SETPRT32.exe** in the installation folder. This program is called later during the installation process to initially select a 1-Wire port. It is also used later to change the type of adapter or port number.

After the 1-Wire drivers are installed, the USB Instructions screen appears. Now plug in the DS9490R USB to 1-Wire adapter and click on **OK** when ready to continue.



1) If you have a 1-Wire USB adapter (DS9490), plug it in now.
2) If this is not a first-time installation, click OK to continue, else goto next step.
3) Wait for Windows to detect your new hardware. If you have trouble, browse with Hardware Wizard to:
C:\Program Files\Dallas Semiconductor\1-Wire Drivers Version 4.00 Beta 4\

From the USB Instruction screen you get to the 1-Wire Net Port Selection screen, on which you must specify which of the ports with a 1-Wire adapter connected is to be defined as the **default 1-Wire Net port**. It is possible to have more than one port adapter plugged in at a time. However, only one of them can be selected as the default.



1-Wire Net Port Selection

Port Selection

PC Port Type: COM

Adapter Required: DS9097U

Port Number: 1

Driver Info

Version: V3.21

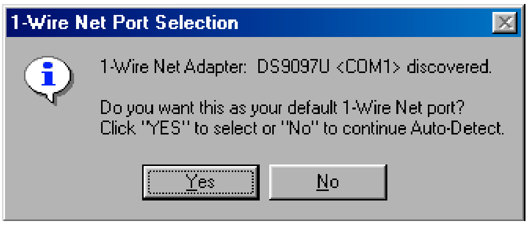
Release Date: 03/15/04

Misc: (IB97U32.DLL)

Select the adapter type tab to the right and then select the appropriate port number. When finished click 'OK'. Or Select Auto-Detect below.

On this screen, select the DS9490 tab that matches the hardware adapter. Next enter the port number where the 1-Wire adapter is attached. After a port number with adapter has been selected, the port type, adapter type and driver information is displayed; now click on **OK** to continue. If a port with no adapter connected is selected, you will get an error message.

If not sure about the port number or adapter type, click on Auto Detect to search through all port types. The result may look like this:



1-Wire Net Port Selection

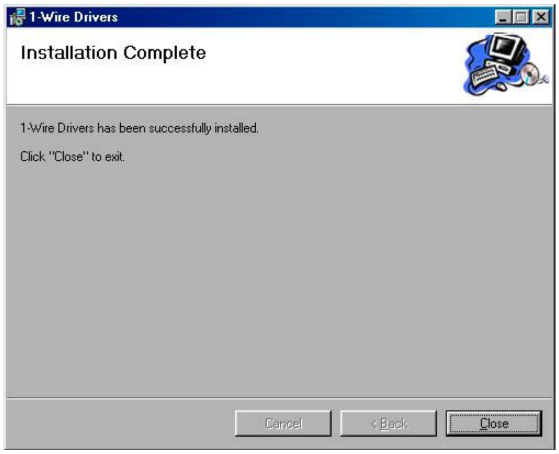
1-Wire Net Adapter: DS9097U <COM1> discovered.

Do you want this as your default 1-Wire Net port?
Click "YES" to select or "No" to continue Auto-Detect.

Click on **Yes** to accept the port as the default.

Note: If you change the 1-Wire port on your computer, 1-Wire application software needs to be reconfigured. Some applications have a function to do this, but it may not change the default 1-Wire port **in the registry**. Updating the registry is critical for applications that do not have any means to select a port, since they rely exclusively on the Default 1-Wire Net port. To change your default port, run **SETPRT32.exe** in the installation folder. This program repeats the 1-Wire Net Port Selection step. When the new port is selected, click on OK.

After the default 1-Wire port is successfully selected, the Installation Complete screen appears. Now click on **Close**. It is not necessary to re-boot your PC.



1-Wire Drivers

Installation Complete

1-Wire Drivers has been successfully installed.

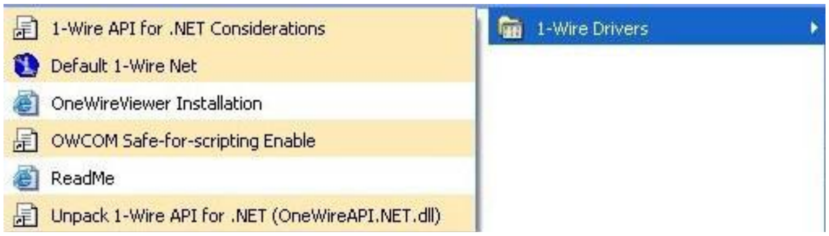
Click "Close" to exit.

Testing the Network

Before setting up the LogTemp Application, if the network needs to be tested, the Maxim Drivers installation installs a Java based viewer.

To run the Java application, go to START> All Programs> 1-wire drivers > OneWireViewer Installation.

This will load a HTML page that states:


1-Wire API for .NET Considerations
Default 1-Wire Net
OneWireViewer Installation
OWCOM Safe-for-scripting Enable
ReadMe
Unpack 1-Wire API for .NET (OneWireAPI.NET.dll)
1-Wire Drivers

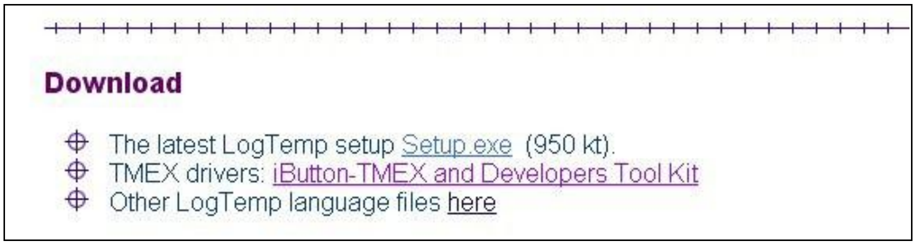
Click on the "1-Wire Drivers" item. This will load a 1-Wire viewer application, that lets you auto-select the interface you're using, and lets you see the various 1-Wire devices you have on your network.

Once device and network integrity is confirmed then focus on the LogTemp Application installation and use.

LogTemp SW by MrSoft

Obtain Application SW from http://www.mrsoft.fi/ohj01en.htm

Go down the web page, and download and install the above **LogTemp** software.



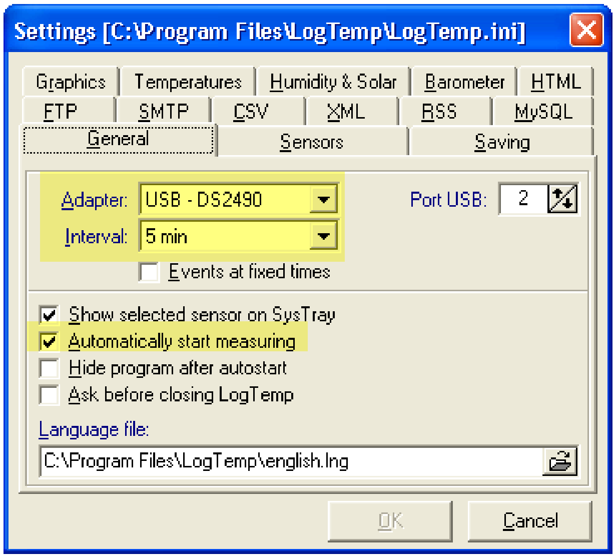
Download

- The latest LogTemp setup Setup.exe (950 kt).
- TMEX drivers: iButton-TMEX and Developers Tool Kit
- Other LogTemp language files here

Once the installation is completed, there is minimal setup to be done.

Go to SHOW> SETUP > General

Set the interface you're using, the COM port, and tell the software the Interval Period that should be used for automatically taking measurements. Five minutes yields good resolution.



Settings [C:\Program Files\LogTemp\LogTemp.ini]

Adapter: USB - DS2490

Interval: 5 min

Port USB: 2

□ Events at fixed times

☑ Show selected sensor on SysTray

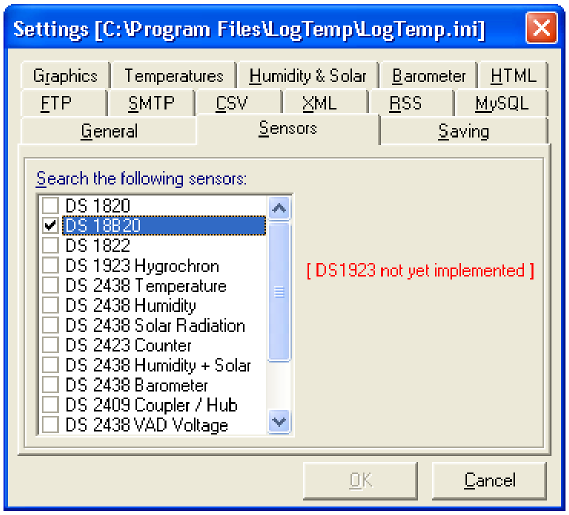
☑ Automatically start measuring

□ Hide program after autostart

□ Ask before closing LogTemp

Language file: C:\Program Files\LogTemp\english.lng

Now go to the Sensors Tab and select the DS18B20 device type to be monitored.



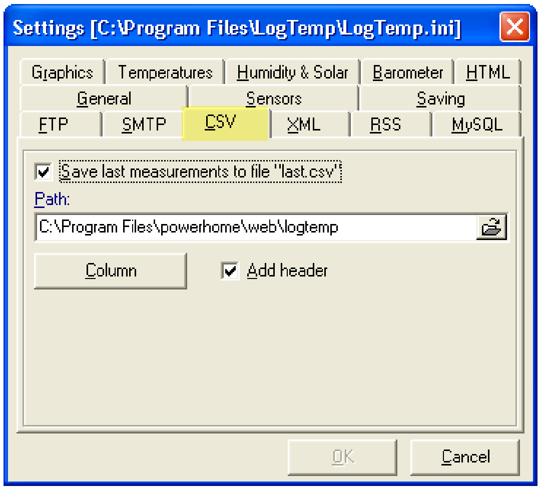
Settings [C:\Program Files\LogTemp\LogTemp.ini]

Search the following sensors:

□ DS 1820
☑ DS 18B20
□ DS 1822
□ DS 1923 Hygrochron
□ DS 2438 Temperature
□ DS 2438 Humidity
□ DS 2438 Solar Radiation
□ DS 2423 Counter
□ DS 2438 Humidity + Solar
□ DS 2438 Barometer
□ DS 2409 Coupler / Hub
□ DS 2438 VAD Voltage

[DS1923 not yet implemented]

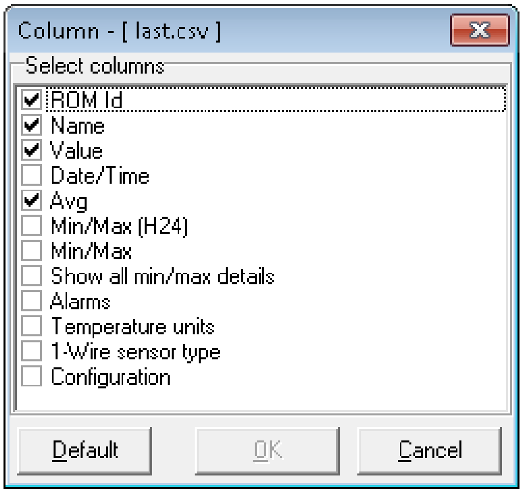
On the “CSV” Tab check the “Save last Measurements…” box and designate the save file path/location.


Settings [C:\Program Files\LogTemp\LogTemp.ini]
Graphics | Temperatures | Humidity & Solar | Barometer | HTML
General | Sensors | Saving
FTP | SMTP | CSV | XML | RSS | MySQL
Column
OK
Cancel

☑ Save last measurements to file "last.csv"

Path: C:\Program Files\powerhome\web\logtemp

☑ Add header



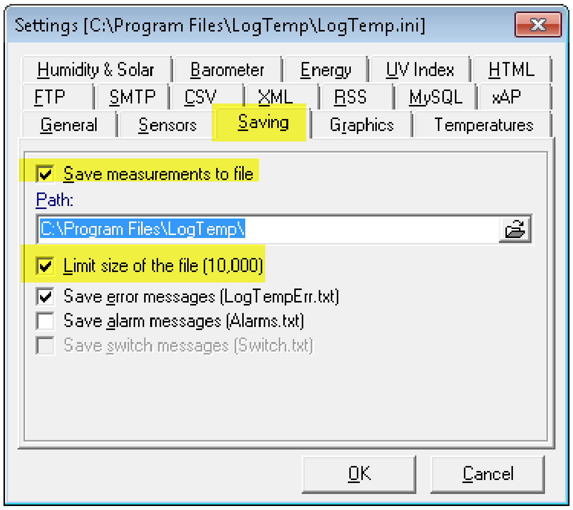
Select columns

☑ ROM Id
☑ Name
☑ Value
☐ Date/Time
☑ Avg
☐ Min/Max (H24)
☐ Min/Max
☐ Show all min/max details
☐ Alarms
☐ Temperature units
☐ 1-Wire sensor type
☐ Configuration

Click the “Column” button and select the <u>four</u> data columns to be saved.

In order to display the measured temps as graphs, check the "Save measurements to file" box on the “Saving” Tab and set the file size limit to 10,000 to permit a full month’s data to be accumulated for the Monthly graphs. Do NOT change the default file Path, or the program will hang up.

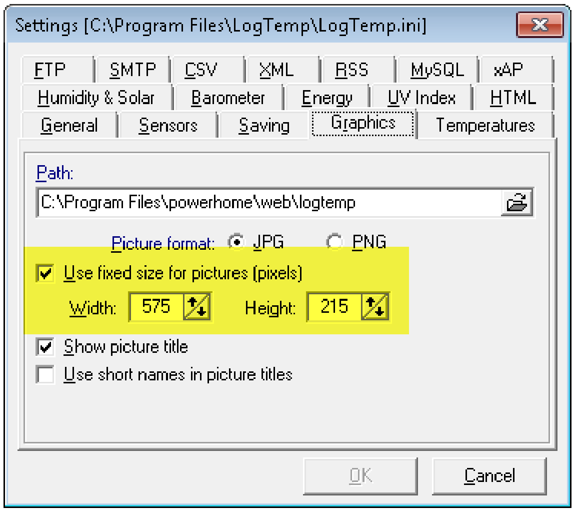
To create a graphic display of the Temp data go to the “Graphics” Tab and setup the save parameters for file location and graphics format. Check the "Show picture file" and "Fixed Size" boxes, and set the image size to 575 x 215.


Settings [C:\Program Files\LogTemp\LogTemp.ini]
Humidity & Solar | Barometer | Energy | UV Index | HTML
FTP | SMTP | CSV | XML | RSS | MySQL | xAP
General | Sensors | Saving | Graphics | Temperatures
OK
Cancel

☑ Save measurements to file

Path: C:\Program Files\LogTemp\

☑ Limit size of the file (10,000)
☑ Save error messages (LogTempErr.txt)
☐ Save alarm messages (Alarms.txt)
☐ Save switch messages (Switch.txt)


Settings [C:\Program Files\LogTemp\LogTemp.ini]
FTP | SMTP | CSV | XML | RSS | MySQL | xAP
Humidity & Solar | Barometer | Energy | UV Index | HTML
General | Sensors | Saving | Graphics | Temperatures
OK
Cancel

Path: C:\Program Files\powerhome\web\logtemp

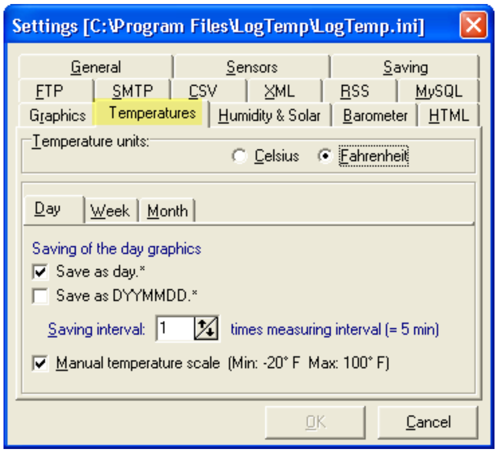
Picture format: ● JPG ○ PNG

☑ Use fixed size for pictures (pixels)

Width: 575 Height: 215

☑ Show picture title
☐ Use short names in picture titles

Finally go to the “Temperatures” Tab and setup the temperature units and on the Day/Week/Month tabs and check the desired save parameters. Note the “Saving Interval” field. For Days, one wants detail so save at the measurement interval, but for the Month chart measurements every hour or two will suffice, so set a longer interval.


Settings [C:\Program Files\LogTemp\LogTemp.ini]
General | Sensors | Saving
FTP | SMTP | CSV | XML | RSS | MySQL
Graphics | Temperatures | Humidity & Solar | Barometer | HTML
Day | Week | Month
OK
Cancel

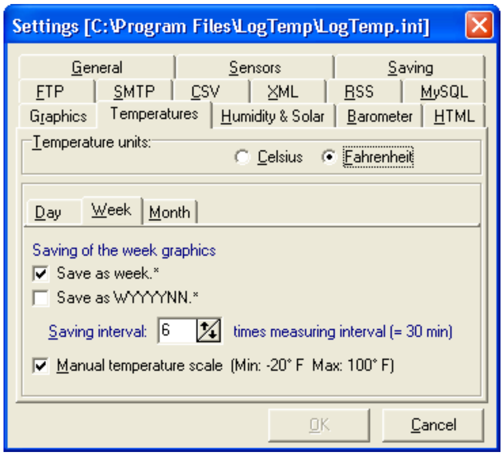
Temperature units: ○ Celsius ● Fahrenheit

Saving of the day graphics

☑ Save as day.*
☐ Save as DYYMMDD.*

Saving interval: 1 times measuring interval (= 5 min)

☑ Manual temperature scale (Min: -20° F Max: 100° F)


Settings [C:\Program Files\LogTemp\LogTemp.ini]
General | Sensors | Saving
FTP | SMTP | CSV | XML | RSS | MySQL
Graphics | Temperatures | Humidity & Solar | Barometer | HTML
Day | Week | Month
OK
Cancel

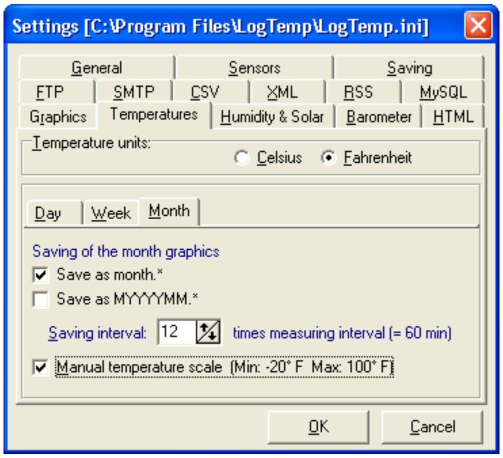
Temperature units: ○ Celsius ● Fahrenheit

Saving of the week graphics

☑ Save as week.*
☐ Save as WYYYYNN.*

Saving interval: 6 times measuring interval (= 30 min)

☑ Manual temperature scale (Min: -20° F Max: 100° F)


Settings [C:\Program Files\LogTemp\LogTemp.ini]
General | Sensors | Saving
FTP | SMTP | CSV | XML | RSS | MySQL
Graphics | Temperatures | Humidity & Solar | Barometer | HTML
Day | Week | Month
OK
Cancel

Temperature units: ○ Celsius ● Fahrenheit

Saving of the month graphics

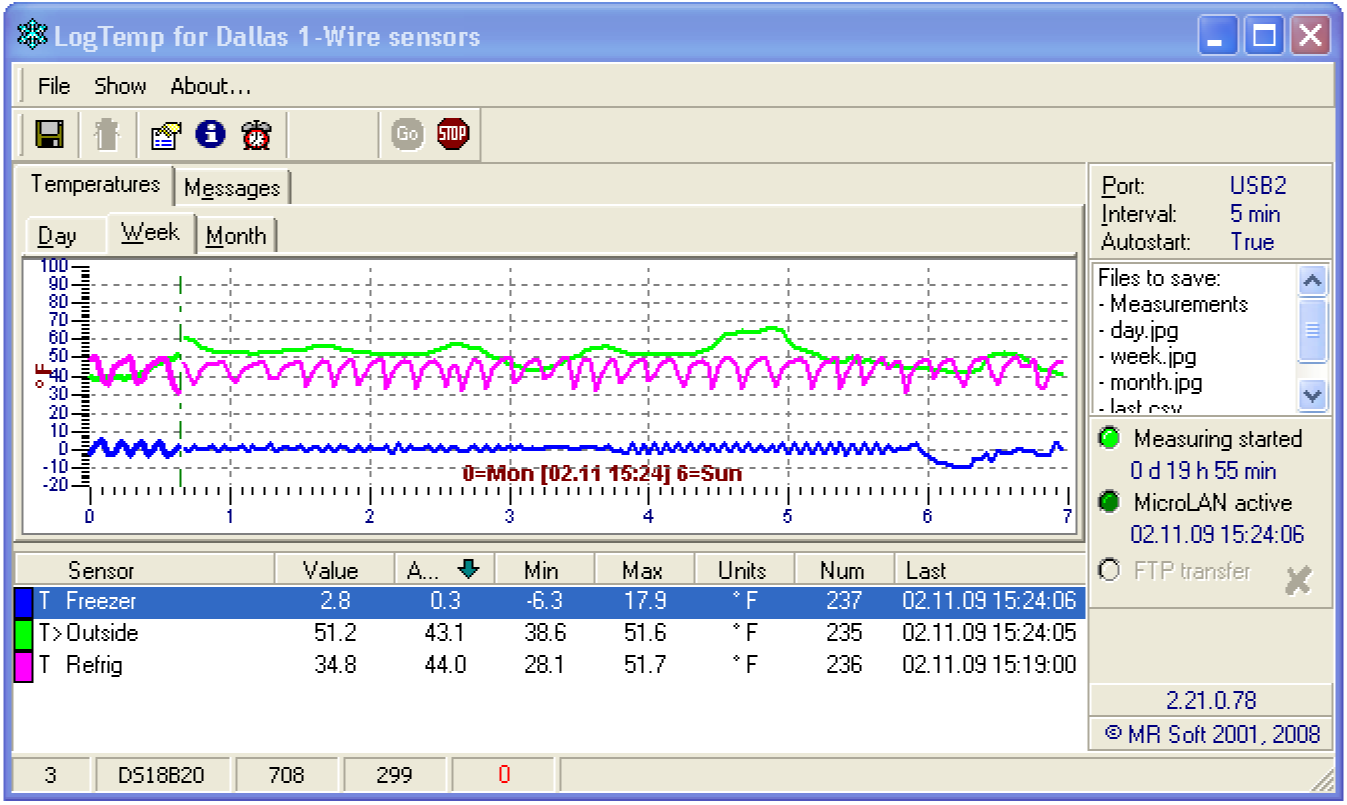
☑ Save as month.*
☐ Save as MYYYYMM.*

Saving interval: 12 times measuring interval (= 60 min)

☑ Manual temperature scale (Min: -20° F Max: 100° F)

If Temperature Error Correction is needed, see Sensor Properties discussion below.
Now, click OK. It brings you back to the main screen
With any luck, LogTemp will have started to scan and read the values of the devices on your network.

If not, use the « GO » button to start the readings. Starting the reading is often a bit slow to start, because the software has to initialize the COM port and such. Don't be in a hurry and do wait a few seconds!



Sensor	Value	A...	Min	Max	Units	Num	Last
🟦 T Freezer	2.8	0.3	-6.3	17.9	° F	237	02.11.09 15:24:06
🟩 T> Outside	51.2	43.1	38.6	51.6	° F	235	02.11.09 15:24:05
🟪 T Refrig	34.8	44.0	28.1	51.7	° F	236	02.11.09 15:19:00

Port: USB2
Interval: 5 min
Autostart: True

Files to save:
- Measurements
- day.jpg
- week.jpg
- month.jpg
- last.csv

● Measuring started
0 d 19 h 55 min
● MicroLAN active
02.11.09 15:24:06
○ FTP transfer

2.21.0.78
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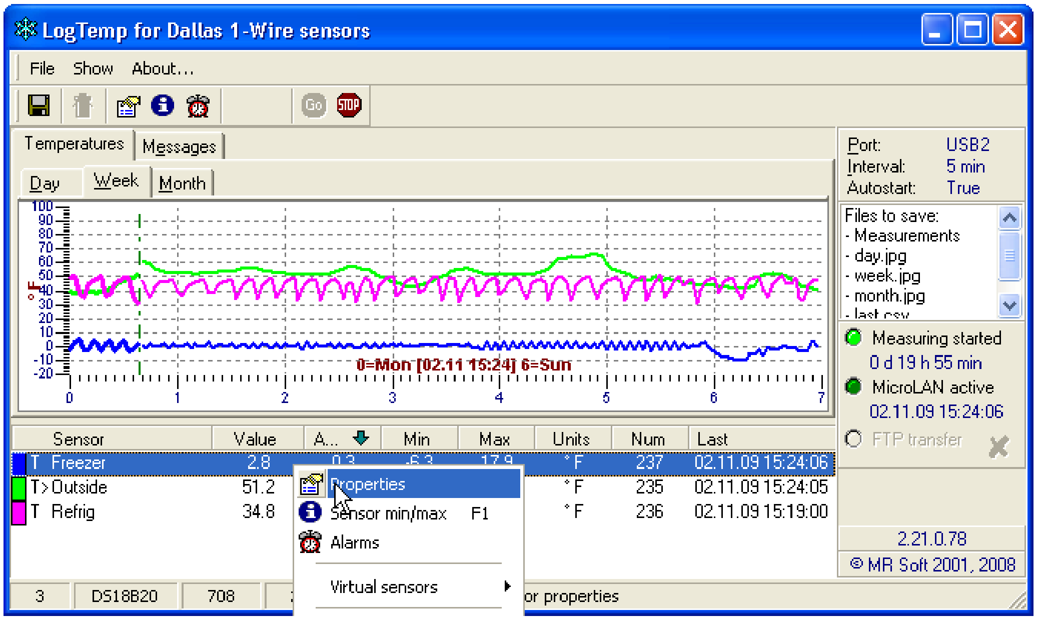
3 | DS18B20 | 708 | 299 | 0

The above Figure shows "nice" sensor names, but unless the defaults are modified via the Properties function, then names will appear as ROM ID serial numbers (not very user friendly). To create friendly names (if ROM ID's are being displayed) select the sensor in the figure above and right-click to get its properties.



Sensor	Value	A...	Min	Max	Units	Num	Last
🟦 T Freezer	2.8	0.3	-6.3	17.9	° F	237	02.11.09 15:24:06
🟩 T> Outside	51.2				° F	235	02.11.09 15:24:05
🟪 T Refrig	34.8				° F	236	02.11.09 15:19:00

Port: USB2
Interval: 5 min
Autostart: True

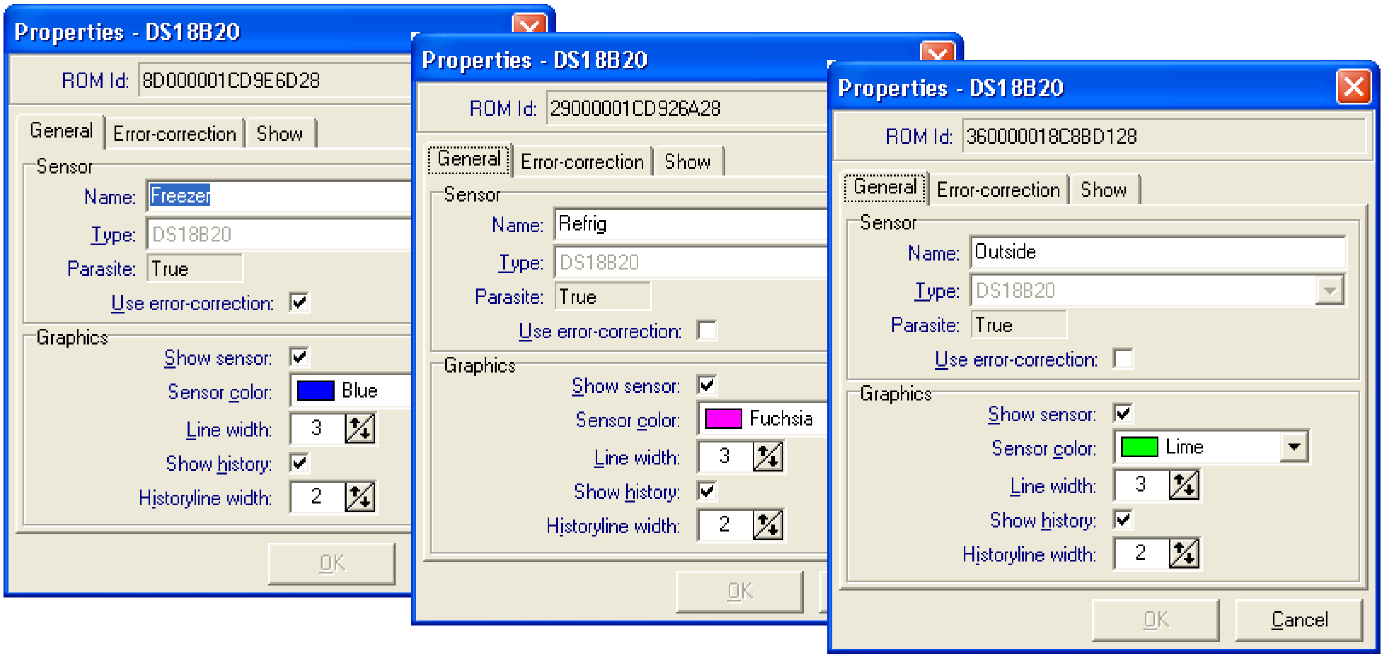
Files to save:
- Measurements
- day.jpg
- week.jpg
- month.jpg
- last.csv

● Measuring started
0 d 19 h 55 min
● MicroLAN active
02.11.09 15:24:06
○ FTP transfer

2.21.0.78
© MR Soft 2001, 2008

3 | DS18B20 | 708 | or properties

In the Properties Window, enter a friendly name in the Name field for each of the sensors . . .



Properties - DS18B20

ROM Id: 8D000001CD9E6D28

General | Error-correction | Show

Sensor

Name: Freezer

Type: DS18B20

Parasite: True

Use error-correction: ☑

Graphics

Show sensor: ☑

Sensor color: Blue

Line width: 3

Show history: ☑

Historyline width: 2

OK

Properties - DS18B20

ROM Id: 29000001CD926A28

General | Error-correction | Show

Sensor

Name: Refrig

Type: DS18B20

Parasite: True

Use error-correction: □

Graphics

Show sensor: ☑

Sensor color: Fuchsia

Line width: 3

Show history: ☑

Historyline width: 2

OK

Properties - DS18B20

ROM Id: 360000018C8BD128

General | Error-correction | Show

Sensor

Name: Outside

Type: DS18B20

Parasite: True

Use error-correction: □

Graphics

Show sensor: ☑

Sensor color: Lime

Line width: 3

Show history: ☑

Historyline width: 2

OK | Cancel

Temperature reading error correction can be applied to each sensor via it's associated Properties screen.

At this point we have a functional Temperature reading application. With just a few more steps, we will be able to read and use the temperature values in PowerHome.

Using LogTemp Readings in Powerhome

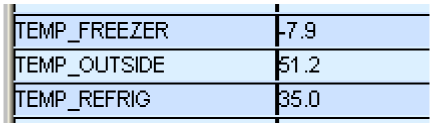
The LogTemp CSV file temp readings content looks like . . .

```
"ROMId","Name","Value","Avg",
"8D000001CD9E6D28","Freezer",-2.99,-2.15,
"360000018C8BD128","Outside",68.45,69.13,
"3F000001CD92C728","Refrig",42.80,37.60,
```

To use this, go to the global variables section of PowerHome.

Create some global variables there using the sensor “friendly” names name. All of them will be prefixed by “TEMP_”. Not for temporary, but for temperature.

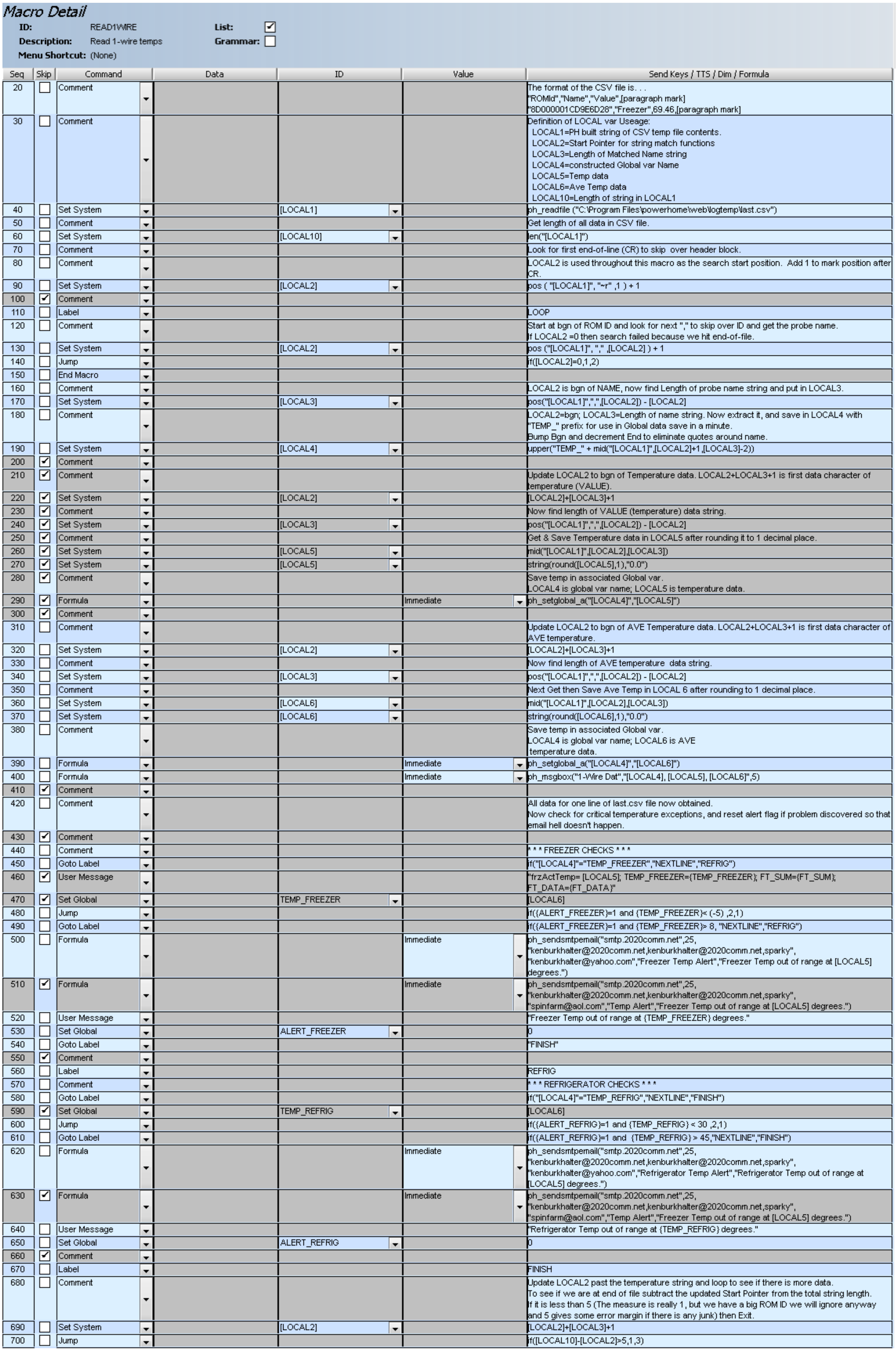
Prefixing the “TEMP_” string allows the PH macros to loop thru the LogTemp CSV file and parse the data and separate it into the different readings while keeping them all together alphabetically for ease of use.



TEMP_FREEZER	-7.9
TEMP_OUTSIDE	51.2
TEMP_REFRIG	35.0

The CSV Temp data could be parsed via a Script or by using PH Macro string processing. The latter method, while a bit more complex, keeps it all closer to home and so is the method used herein.

See following page . . .



Macro Detail

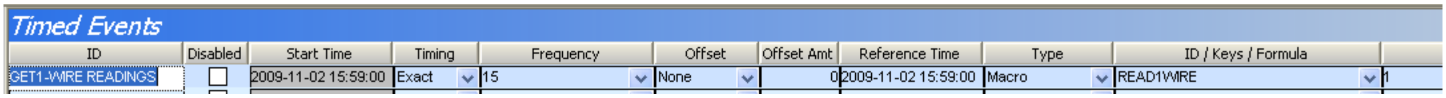
ID: READ1WIRE **List:** ☑

Description: Read 1-wire temps **Grammar:** □

Menu Shortcut: (None)

Seq	Skip	Command	Data	ID	Value	Send Keys / TTS / Dim / Formula
20	□	Comment				The format of the CSV file is. . . "ROMId","Name","Value",[paragraph mark] "8D000001CD9E6D28","Freezer",69.46,[paragraph mark]
30	□	Comment				Definition of LOCAL var Useage: LOCAL1=PH built string of CSV temp file contents. LOCAL2=Start Pointer for string match functions LOCAL3=Length of Matched Name string LOCAL4=constructed Global var Name LOCAL5=Temp data LOCAL6=Ave Temp data LOCAL10=Length of string in LOCAL1
40	□	Set System		[LOCAL1]		ph_readfile ("C:\Program Files\powerhome\web\logtemp\last.csv")
50	□	Comment				Get length of all data in CSV file.
60	□	Set System		[LOCAL10]		len("[LOCAL1]")
70	□	Comment				Look for first end-of-line (CR) to skip over header block.
80	□	Comment				LOCAL2 is used throughout this macro as the search start position. Add 1 to mark position after CR.
90	□	Set System		[LOCAL2]		pos ("[LOCAL1]", "~r" ,1) + 1
100	☑	Comment				
110	□	Label				LOOP
120	□	Comment				Start at bgn of ROM ID and look for next "," to skip over ID and get the probe name. If LOCAL2 =0 then search failed because we hit end-of-file.
130	□	Set System		[LOCAL2]		pos ("[LOCAL1]", "," ,[LOCAL2]) + 1
140	□	Jump				if([LOCAL2]=0,1,2)
150	□	End Macro				
160	□	Comment				LOCAL2 is bgn of NAME, now find Length of probe name string and put in LOCAL3.
170	□	Set System		[LOCAL3]		pos("[LOCAL1]",",",[LOCAL2]) - [LOCAL2]
180	□	Comment				LOCAL2=bgn; LOCAL3=Length of name string. Now extract it, and save in LOCAL4 with "TEMP_" prefix for use in Global data save in a minute. Bump Bgn and decrement End to eliminate quotes around name.
190	□	Set System		[LOCAL4]		upper("TEMP_" + mid("[LOCAL1]",[LOCAL2]+1,[LOCAL3]-2))
200	☑	Comment				
210	☑	Comment				Update LOCAL2 to bgn of Temperature data. LOCAL2+LOCAL3+1 is first data character of temperature (VALUE).
220	☑	Set System		[LOCAL2]		[LOCAL2]+[LOCAL3]+1
230	☑	Comment				Now find length of VALUE (temperature) data string.
240	☑	Set System		[LOCAL3]		pos("[LOCAL1]",",",[LOCAL2]) - [LOCAL2]
250	☑	Comment				Get & Save Temperature data in LOCAL5 after rounding it to 1 decimal place.
260	☑	Set System		[LOCAL5]		mid("[LOCAL1]",[LOCAL2],[LOCAL3])
270	☑	Set System		[LOCAL5]		string(round([LOCAL5],1),"0.0")
280	☑	Comment				Save temp in associated Global var. LOCAL4 is global var name; LOCAL5 is temperature data.
290	☑	Formula			Immediate	ph_setglobal_a("[LOCAL4]","[LOCAL5]")
300	☑	Comment				
310	□	Comment				Update LOCAL2 to bgn of AVE Temperature data. LOCAL2+LOCAL3+1 is first data character of AVE temperature.
320	□	Set System		[LOCAL2]		[LOCAL2]+[LOCAL3]+1
330	□	Comment				Now find length of AVE temperature data string.
340	□	Set System		[LOCAL3]		pos("[LOCAL1]",",",[LOCAL2]) - [LOCAL2]
350	□	Comment				Next Get then Save Ave Temp in LOCAL 6 after rounding to 1 decimal place.
360	□	Set System		[LOCAL6]		mid("[LOCAL1]",[LOCAL2],[LOCAL3])
370	□	Set System		[LOCAL6]		string(round([LOCAL6],1),"0.0")
380	□	Comment				Save temp in associated Global var. LOCAL4 is global var name; LOCAL6 is AVE temperature data.
390	□	Formula			Immediate	ph_setglobal_a("[LOCAL4]","[LOCAL6]")
400	□	Formula			Immediate	ph_msgbox("1-Wire Dat","[LOCAL4], [LOCAL5], [LOCAL6]",5)
410	☑	Comment				
420	□	Comment				All data for one line of last.csv file now obtained. Now check for critical temperature exceptions, and reset alert flag if problem discovered so that email hell doesn't happen.
430	☑	Comment				
440	□	Comment				* * * FREEZER CHECKS * * *
450	□	Goto Label				if("[LOCAL4]"="TEMP_FREEZER","NEXTLINE","REFRIG")
460	☑	User Message				"frzActTemp= [LOCAL5]; TEMP_FREEZER={TEMP_FREEZER}; FT_SUM={FT_SUM}; FT_DATA={FT_DATA}"
470	☑	Set Global		TEMP_FREEZER		[LOCAL6]
480	□	Jump				if({ALERT_FREEZER}=1 and {TEMP_FREEZER}< (-5) ,2,1)
490	□	Goto Label				if({ALERT_FREEZER}=1 and {TEMP_FREEZER}> 8, "NEXTLINE","REFRIG")
500	□	Formula			Immediate	ph_sendsmtpemail("smtp.2020comm.net",25, "kenburkhalter@2020comm.net,kenburkhalter@2020comm.net,sparky", "kenburkhalter@yahoo.com","Freezer Temp Alert","Freezer Temp out of range at [LOCAL5] degrees.")
510	☑	Formula			Immediate	ph_sendsmtpemail("smtp.2020comm.net",25, "kenburkhalter@2020comm.net,kenburkhalter@2020comm.net,sparky", "spinfarm@aol.com","Temp Alert","Freezer Temp out of range at [LOCAL5] degrees.")
520	□	User Message				"Freezer Temp out of range at {TEMP_FREEZER} degrees."
530	□	Set Global		ALERT_FREEZER		0
540	□	Goto Label				"FINISH"
550	☑	Comment				
560	□	Label				REFRIG
570	□	Comment				* * * REFRIGERATOR CHECKS * * *
580	□	Goto Label				if("[LOCAL4]"="TEMP_REFRIG","NEXTLINE","FINISH")
590	☑	Set Global		TEMP_REFRIG		[LOCAL6]
600	□	Jump				if({ALERT_REFRIG}=1 and {TEMP_REFRIG} < 30 ,2,1)
610	□	Goto Label				if({ALERT_REFRIG}=1 and {TEMP_REFRIG} > 45,"NEXTLINE","FINISH")
620	□	Formula			Immediate	ph_sendsmtpemail("smtp.2020comm.net",25, "kenburkhalter@2020comm.net,kenburkhalter@2020comm.net,sparky", "kenburkhalter@yahoo.com","Refrigerator Temp Alert","Refrigerator Temp out of range at [LOCAL5] degrees.")
630	☑	Formula			Immediate	ph_sendsmtpemail("smtp.2020comm.net",25, "kenburkhalter@2020comm.net,kenburkhalter@2020comm.net,sparky", "spinfarm@aol.com","Temp Alert","Freezer Temp out of range at [LOCAL5] degrees.")
640	□	User Message				"Refrigerator Temp out of range at {TEMP_REFRIG} degrees."
650	□	Set Global		ALERT_REFRIG		0
660	☑	Comment				
670	□	Label				FINISH
680	□	Comment				Update LOCAL2 past the temperature string and loop to see if there is more data. To see if we are at end of file subtract the updated Start Pointer from the total string length. If it is less than 5 (The measure is really 1, but we have a big ROM ID we will ignore anyway and 5 gives some error margin if there is any junk) then Exit.
690	□	Set System		[LOCAL2]		[LOCAL2]+[LOCAL3]+1
700	□	Jump				if([LOCAL10]-[LOCAL2]>5,1,3)

To cause automatic Temp readings on a timed basis, setup a TIMED EVENT in PH. Create a new Event (named here "GET1-WIRE READINGS"). The setting below, reads the network every 15 minutes.



Timed Events

ID	Disabled	Start Time	Timing	Frequency	Offset	Offset Amt	Reference Time	Type	ID / Keys / Formula	
GET1-WIRE READINGS	☐	2009-11-02 15:59:00	Exact	15	None	0	2009-11-02 15:59:00	Macro	READ1WIRE	1

That's it! Things should now work.