Datalogger and RS232 Interface

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RS-232 Protocol

On Line Transfer (8 bytes data to PC)

Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Start 02	Status1	Status2	Status3		Stop 03		

Details:

(1) Start byte 02 (Byte1)

(2) Status1 (Byte2)

bit7	bit6	bit5	bit4	bit3 bit2		bit0~1				
Full	Auto Rec.	No.99	Auto pwr off	вт	0:C 1:F	0:T1 1:T2 2:T3 3:T4				

(3) Status2 (Byte3)

bit7	bit6	bit5	bit4	bit0~bit3										
Reserved	reserved	hold	read	0:K	1:J	2:E	3:T	4:R	5:S	6:N	7:L	8:U	9:B	10:C

(4) Status3 (Byte4)

bit7	bit6	bit5	bit4	bit3	bit2	bit0~1			
Reserved	under	over	Out range	plug	rec	0:normal 1:max 2:min 3:max-min			

(5) Fahrenheit

Byte5	Byte6	Byte7						
Fahrenheit Integer		bit7: positive	bit4,5: X	bit0~3: Fahrenheit Decimal				

If Positive then Fahrenheit Integer = 65536 - Fahrenheit

(6) Stop Byte 03 (Byte6)

Pre-Order

"A" command:

Byte1	Byte2	Byte3	Byte4 Byte5		Byte6	Byte7
02	La	ast Add of Auto	o Rec.s	Manual Rec.s	FF	03

Commands: (after "A" command)

Q : Read Manually Recorded Data

02 + No.s of Rec.s + Data1 + Data2+.....+03

Data : Flg0 + Flg8 + Flg9 + (T1-T4)Type + YYMMDDhhnnss + T1F + T2F + T3F + T4F (3 Bytse + 4 Bytes + 6 Bytes + 3 Bytes x 4)

R : Read Automatically Recorded Data

02 + Last Add + Data1 + Data2+.....+03 Data : 00 55 AA 00 + Flg0 + (T1-T4)Type + YYMMDDhhnnss + Intv + Rec.s + Flg8 + Flg9 + (T1F + T2F + T3F + T4F) + Flg8 + Flg9 + (T1F + T2F + T3F + T4F)+.....+03 (4 Bytes + 1 Byte + 4 Bytes + 6 Bytess + 1 Bytes + 3 Bytes + 2 Bytes + (3 Bytes x 4)

19200,N,8,1

_		-	
	\sim	n	
	()	U	
•		~	•

bit1~7	bit0	
Reserved	F	

Flg8

bit7	bit4~6	bit3	bit2	bit1	bit0
Out range	Reserved	T4 Plug	T3 Plug	T2 Plug	T1 Plug

Flg9

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
T4 Under	T3 Under	T2 Under	T1 Under	T4 Over	T3 Over	T2 Over	T1 Over

T: Set up Time of Meter

(4 Bytes)

"T" + hh + nn + ss

Туре

	bit4~7	bit0~bit3											
F	Reserved	0:K	1:J	2:E	3:T	4:R	5:S	6:N	7:L	8:U	9:B	10:C	

Fahrenheit

Byte1	Byte2	Byte3				
Fahrenheit Integer		bit7: positive	bit4,5: X	bit0~3: Fahrenheit Decimal		

S : Set up Date of Meter

"S" + YY + MM + DD (4 Bytes)

X : Read Real Time Clock

02 + YYMMDDhhnnss + 03 (8bytes)

U : Intv

"U" + 0 + 0 + 0 : Read Intv (02 + Intv + 03)

"U" + 1 + Intv + 0: Set up Intv

V : Power-off Time

"V" + 0 + 0 : Read Power-off Time (02 + Index + 03)

"V" + 1 + Index + 0 : Set up Power-off Time

Index:

0	1	2
5 min	15 min	30 min

W : Button command

"W" + B1 + B2 + B3 : Button Command

B1:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
TYPE	МЕМ	MAX	TIME	SET	C/F	Alarm	Read

B2:

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
A.Rec.	Reserved	Down	Right	Enter	Left	Up	Hold

B3:

bit3~bit7	bit2	bit1	bit0
Reserved	Cancel MMA Rec	Cir Auto	Cir Manual

Hardware Requirements and Setup

PC HardWare Requirements :

HDD, CD Rom, 486 PC or above, with USB port EGA or higher monitor 4M bytes or more memory size

PC HardWare Setup :

Connect the Meter with PC by USB cable

Software Requirements and Setup

- 1) Start up windows XP operating system
- 2) Close all other applications
- 3) Insert the disk in CD drive

🕲 Ins	tallatio	n 🔀
USB	Driver	Meter Software
Click	USB Dr	iver

(If "autorun" does not start, click on "Start" then "Run". Type the drive letter and ": \USBDriver\Install.exe" and click "OK" .)

Follow the on-screen instructions to set up USB driver.

- 4) Restart the personal computer.
- 5) Insert the disk in CD drive

lo Ins	tallation	×
USB	Driver	Meter Software
Click	Meter Software	

(If "autorun" does not start, click on "Start" then "Run". Type the drive letter and

": \Software\setup.exe" and click "OK" .)

6) Follow the on-screen instructions.

1).



Setup program will run automatically.

2).



Click Next> button

3).

Choose Destination Lo	cation	×
	Setup will install D4IThermoMeter in the following folder. To install to this folder, click Next. To install to a different folder, click Browse and select another folder. You can choose not to install D4IThermoMeter by clicking Cancel to exit Setup.	
	C:\\D4IThermoMeter\D4IThermoMeter Browse	
	< <u>B</u> ack <u>Next</u> > Cancel	

a. Click <u>N</u>ext> to use the default folder

or

b. Click Browse... to select a different folder

4).

Select Program Folder	X
	Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing Folders list. Click Next to continue. Program Folders: D4IThermoMeter Existing Folders: Administrative Tools AVG Free 9.0 Ease Audio Converter Games InstallShield 5.5 Professional Edition
	Nero 7 Essentials PL-2303 USB-Serial Driver
	< <u>B</u> ack <u>N</u> ext > Cancel

Click <u>N</u>ext> button

🛃 D4IThermoMeter Setup		
D4IThermoMe	ter	
2 111 100 110		
	Copying program files c\program files\htmeter\htmeter.exe 2 %	

Setup is completed.

On-Line Operation

Run the software

1. Click "Start" form Start menu then move to "All Programs" (or "Programs") then "D4IThermoMeter" and then click the "D4IThermoMeter" icon.



2.

Click an available COM port



3. Main software screen



Record

Save to Hard Disk (PC)

Click 🖬 button. The dialog box shown below will appear.

Save As		? 🗙
Savejn:	My Documents 💽 🔶 🖆 🏢 -	
D Recent	ea My Music 但 My Pictures	
Desktop		
My Documents		
My Computer		
S	File <u>n</u> ame:	/e
My Network Places	Save as <u>type:</u> Data Files (*.txt)	

Input a file name and then click "Save" to begin saving data to the file just named.



Click 🖭 button to stop recording.

Save to EEPROM

1. Automatically Record

Keep pressing <u>MEM</u> on the meter till <u>A-M</u> flashes on LCD to record data. Keep pressing <u>MEM</u> again till <u>A-M</u> disappears to stop recording.

2. Manually Record

Press the MEM on the meter momentarily to store one reading. The M then flashes once.

Download Data

1. Download Data from Hard Disk

Open					? 🔀
Look jn:	📋 My Document	ts	•	+ 🗈 💣 🎟+	
📁 Recent	📸 My Music 🖳 My Pictures				
Desktop					
My Documents					
My Computer					
	File <u>n</u> ame:			•	<u>O</u> pen
My Network Places	Files of <u>type</u> :	Data Files (*.txt) Open as <u>r</u> ead-only		•	Cancel

Click 🗐 button. The Open window, shown below, appears

Input the file that was selected earlier and then click the Open button.

2. Download Data from EEPROM

Click Sutton. The Load window, shown below, will open.

	🔷 Data Log	ger		X
	Memory Size	Remained	100.0%	& Completed
	512 K	495.7		
	Set Date-	Time	Intv.	Rec.s
	1 2010/0	3/19 11:09:41	1	145
	2 2010/0	3/19 11:12:58	1	421
	3 2010/0	3/19 11:20:08	1	38
Load				
Automatically Recorded Data				
C Manually Recorded Data				

Click on a SET number to view the set's details. For example, in the window above, there are 3 sets from which to choose. The list below side is an example of an opened set.

🎞 Data I	List					×
🗖 🖓						
۴F	Date Time	T1 · K	T2-K	T3-K	T4 · K	
1	2010/03/19 11:09:41	73.3	72.9	73.3	72.9	
2	2010/03/19 11:09:42	73.3	72.9	73.3	72.9	
3	2010/03/19 11:09:43	73.3	73.0	73.3	72.9	
4	2010/03/19 11:09:44	73.3	73.0	73.1	72.9	
5	2010/03/19 11:09:45	73.3	73.0	73.1	72.9	
6	2010/03/19 11:09:46	73.3	73.0	73.1	73.0	
7	2010/03/19 11:09:47	73.3	73.0	73.1	73.0	
8	2010/03/19 11:09:48	73.3	73.0	73.1	73.0	
9	2010/03/19 11:09:49	73.3	73.0	73.1	73.0	
10	2010/03/19 11:09:50	73.3	73.0	73.3	73.0	-

To read manually recorded data, select Manually Recorded data then Press OK to confirm.

	⊞ M	III Manual Record					
	8	x					
		Date Time	T1	T2	T3	T4	
	۴F	2010/03/19 11:12:09	K: 72.8	K: 72.8	K: 73.4	K: 73.0	
	۴F	2010/03/19 11:12:12	K: 72.8	K: 72.8	K: 74.3	K: 73.0	
	۴F	2010/03/19 11:20:03	K: 73.4	K: 73.6	K: 73.3	K: 74.9	
Load							
Automatically Recorded Data							
Manually Recorded Data OK							

Erase Memory

Click 📕 button. The dialog box, shown below, will open.

Erase Automatically Recorded Data Manually Recorded Data OK
Warning
All the Automatically Recorded data in memory will be deleted!
Erase C Automatically Recorded Data C Manually Recorded Data OK
Warning X All the Manually Recorded data in memory will be deleted!
OK Cancel

Press **OK** button to confirm.

Data Convert

Apply for Excel

Open Microsoft Excel, find the file saved in Excel type, for example, test.xls.

Open													?	×
Look <u>i</u> n:	🛅 My Docur	nents		•	+	£	Q	×	ď	:::: -	Tools	•		
History My Documents Desktop Favorites	Adobe	5												
Mv Network	File <u>n</u> ame:									•	[2 2	pen	•
Places	Files of <u>type</u> :	All File	s							-		Ca	incel	
		All File All Mici Micros Web P Text F Query	s rosoft Excel F oft Excel Files 'ages iles Files	Files s						•				

or find any file already saved in HDD, for example, sample.dat.

The "Text Import Wizard" then appears. Follow the steps 1 to 3 to complete.

Text Import Wizard - Step 1 of 3	?×
The Text Wizard has determined that your data is Delimited. If this is correct, choose Next, or choose the data type that best describes your data. Original data type Choose the file type that best describes your data: © Delimited Characters such as commas or tabs separate each field. © Fixed width - Fields are aligned in columns with spaces between each field.	
Start import at <u>r</u> ow: 1 File <u>o</u> rigin: Windows (ANSI)	•
Preview of file C:\Documents and Settings\HappySheu\\sample.4ch.	
1 *FDate TimeT1 - KT2 - KT3 - KT4 - K 2 12010/03/19 11:09:4173.372.973.372.9 3 22010/03/19 11:09:4273.372.973.372.9 4 32010/03/19 11:09:4373.373.073.372.9 5 42010/03/19 11:09:4473.373.073.172.9	
<u> </u>	F
Cancel < Back Next >	sh

Click Next> button

Text In	nport Wizard - Step 2 of 3	? 🔀
This so how y	creen lets you set the delimiters your data contains. You can see our text is affected in the preview below.	
Delim	iters	niters as one
	Tab Semicolon Comma	
	Space 🔽 Other: Text gualifier:	•
-Data p	review	
° F	Date Time T1 - K T2 - K T3 - K T4 - K	
2	2010/03/19 11:09:41 73.3 72.9 73.3 72.9	
3	2010/03/19 11:09:43 73.3 73.0 73.3 72.9	
4	2010/03/19 11:09:44 73.3 73.0 73.1 72.9	-
		_
	Cancel < <u>B</u> ack Next >	Einish

Click Next> button

Text Import Wizard - Step 3 o	f 3				? 🛛
This screen lets you select each colur the Data Format.	nn and set	ſ	Column dat ⓒ <u>G</u> enera	a format — al	
'General' converts numeric values to values to dates, and all remaining v	o numbers, alues to te	, date ext.	C <u>⊺</u> ext C <u>D</u> ate:	•	
			C Do not	import col	umn (skip)
<u>A</u> dvanced					
Data preview					21
Propose Time	Jeneral Tl - V	Jenera. T2 - V	$r_2 - v$	Jeneral T4 - V	seneral
1 2010/03/19 11:09:41	73.3	72.9	73.3	72.9	
2 2010/03/19 11:09:42	73.3	72.9	73.3	72.9	
3 2010/03/19 11:09:43	73.3	73.0	73.3	72.9	
4 2010/03/19 11:09:44	73.3	73.0	73.1	72.9	-
					•
	Cape	el	< Back	Nex	Finish
			4 Darie		

Click Finish button

	A	В	С	D	E	F	
1	°F	Date Time	T1 - K	T2 - K	T3 - K	T4 - K	
2	1	3/19/2010 11:09	73.3	72.9	73.3	72.9	
3	2	3/19/2010 11:09	73.3	72.9	73.3	72.9	
4	3	3/19/2010 11:09	73.3	73	73.3	72.9	
5	4	3/19/2010 11:09	73.3	73	73.1	72.9	

Apply for Graph

Open a saved data file in the software program and then select a channel to confirm.

🎟 samp	le.4ch						×
8	c	lick					
۴F	Date Time	п к		T2-K	T3-K	T4 - K	
1	2010/03/19 11:09:41	73	13	72.9	73.3	72.9	
2	2010/03/19 11:09:42	73	33	72.9	73.3	72.9	
3	2010/03/19 11:09:43	73	33	73.0	73.3	72.9	
4	2010/03/19 11:09:44	73	33	73.0	73.1	72.9	
5	2010/03/19 11:09:45	73	33	73.0	73.1	72.9	
6	2010/03/19 11:09:46	73	33	73.0	73.1	73.0	
7	2010/03/19 11:09:47	73	33	73.0	73.1	73.0	
8	2010/03/19 11:09:48	73	33	73.0	73.1	73.0	
9	2010/03/19 11:09:49	73	33	73.0	73.1	73.0	
10	2010/03/19 11:09:50	73		73.0	73.3	73.0	-



Sampling Time

PC Sampling Rate:

(rate at which the PC collects readings while connected to the meter)

Click 💁 on the **Menu Bar**.



Choose "PC Sampling Rate" and then click "OK" buton.



In the **Input Sampling Time** dialog box, input a sampling time and then click **"OK**" button to confirm.

Meter Sampling Rate:

(rate at which meter stores readings)



Choose "PC Sampling Rate" and then click "OK" buton.

Input Sampling Time	X
Enter the SAMPLING TIME in seconds (1 <= t <= 255)	OK Cancel
0	

Input a sampling time and then click **"OK**" button to confirm.

RTC (Real Time Clock)

Click On the **Menu Bar** to set the meter time to PC system time.

Time
PC System Time
Meter Time
Set Meter Time To System Time
Exit

Click **PC System Time** to show PC System Time or **Meter Time** to show Meter Time.

Time
2010/03/23 09:35:39
2010/03/23 09:35:39
Set Meter Time To System Time
Exit

Click Set Meter Time To System Time to set the meter time to PC system time.

Auto Power Off

Click Menu Bar. The window shown below will appear.



Select an expected power-off Time to confirm.



Alarm Range

Click 📓 on the **Menu Bar.** The window shown below will appear.



Change the alarm range and then press

ok to confirm.

