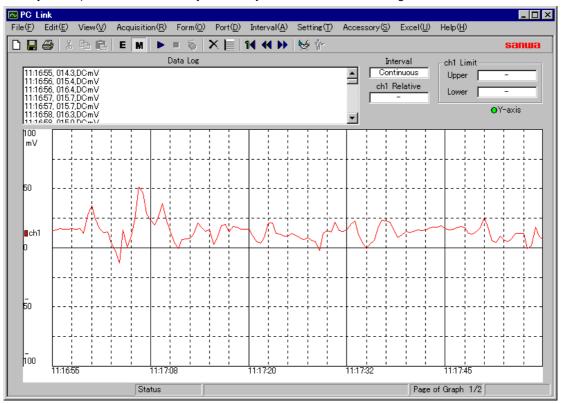


Introduction ...

Welcome to the PC Link software. The PC Link application allows you to record data using your Digital Multi Meter (DMM) SANWA PC series with your PC via RS-232C cable. The recorded data saved a CSV format file, thus you can open another application such as MS Excel, Lotus 123, or you can record directory to the MS Excel using DDE function (the MS Excel must be installed in your PC). That feature allows you to use your DMM in the Auto-Range function.



Features

- * Each model of PC10, PC20, PC20TK, PC100, PC101, PC500, PC510, PC520M PC1000, and PC5000 can be used.
- * Real time graph display with scaled grid.
- * Print displayed graph screen.
- * Copy to clipboard displayed graph screen.
- * Scroll displayed graph.
- * Saved data by CSV format with date and number.
- * Direct data transfer to Excel is possible.
- * Display maximum and minimum value with real time and date.
- * Alarm when out of set value.
- * Acquire deviation from reference value.
- * Select acquisition time Intervals.
- * Expand measuring function by optional accessories.(Temperature probe, Clamp current probe)

Note. In T-300PC temperature measurement, display of DMM can not read direct as temperature value, but your computer can display as degrees centigrade(C) or degrees Fahrenheit(F).

Note. In clamp current probe measurement, unit of DMM display is mV or V, but your computer display A (ampere).

Note. 9999uF ranges of PC500, 510, 520M, 5000 cannot be used by PCLink.

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License and Copyright

License and Copyright

- * MS, Windows, Excel ,Visual Basic ,Visual C++ , Pentium ,are either trademarks or registered trademarks.
- * All other company names, products are either trademarks or registered trademarks of their respective owners.

Read first

Warning Instruction for DMM Safe Use

To ensure that the meter is used safety, Be sure to observe the instruction when using the instrument.

- 1. Never use meter on the electric circuit that Exceed 3kVA.
- 2. Never apply an input signals exceeding the maximum rating input value.
- 3. Never use meter if the meter or test leads are damaged or broken.
- 4. Pay special attention when measuring the voltage of 30Vrms(42.4V peak) or DC60V or more to Avoid injury.
- 5. Never use meter for measuring the line connected with equipment (i.e motors) that generates induced or surge voltage since it may exceed the maximum allowable voltage.
- 6. Never use uncased meter.
- 7. Be sure to use a fuse of the specified rating or type. Never use a substitute of the fuse or never make a short circuit of the fuse.
- 8. Be sure to use in watching possible area, when automatically measuring the voltage of 30Vrms(42.4V peak) or DC60V or more. Out of watching area, you cannot action when trouble (i.e failure of DMM or equipment, Electric shock of other person).
- 9. When connecting and disconnecting the test leads, first connecting the ground lead (black one). When disconnecting them, the ground lead must be disconnected last.
- 10. Always keep your fingers behind the finger guards on the probe when making measurement.
- 11.Be sure disconnect the test pins from the circuit when changing the function.
- 12.Before starting measurement, make sure that the function and range are properly set in accordance with the measurement.
- 13. Never use meter with wet hands or in a damp environment.
- 14. Never open meter case except when replacing batteries or fuse.
- 15.Do not attempt any alternation of original specifications.
- 16.To avoid over heat of meter when measure large current, Be sure to use clamp probe.(Please refer specifications of DMM manual.)
- 17.Indoor use only.
- 18.To ensure safety and maintain accuracy, calibrate and check the meter at least once a year.

About software

When install on Windows95, WindowsNT4.0

Windows95 Install of Internet Explorer 4.01 or later is necessary.

WindowsNT4.0 Install of Internet Explorer 4.01 and Service Pack 3 or later are necessary.

Using the DMM in the "Auto Range" mode

If you use CSV data file as the spreadsheet application, and you set the DMM in the AUTO RANGE, you must set the PC Link in Excel Format (Floating point number).

If you set the PC Link in DMM Format, the spreadsheet application cannot recognize range change.

PC's processing speed problems

If your PC is too slow, you will have following symptoms. A "Buffer Over Flow" error message box will appear while taking the Data. When the PC Link runs under the Excel Export mode, the Acquisition Button in the Toolbar will not work or response will be delayed extremely. You can avoid these problems by increasing the Data Acquisition Time Interval to the appropriate value.

Time Stamp Error

The Time Stamps in the PC Link window will be missing or display incorrect interval time, while running other programs simultaneously.

K type temperature sensor(PC510,PC520M)

Please set effective when measurement is begin from 1000 oF or more.

If not checked then dimension become to oC.

Please cancel check after measurement.

Limitation of capacitance measurement(PC500.510,520M,5000)

9999uF ranges of PC500, 510, 520M, 5000 cannot be used by PCLink.

Information of peripheral equipment

USB interface

You can connect DMM to USB port by RS232C - USB adapter.

The following DMM models can be used.
PC10, PC20, PC20TK, PC100, PC101, PC1000, PC500, PC510, PC520M, PC5000

Confirmation adapter
RS232C -USB adapter (Maker I/O data http://www.iodata.co.jp)
Model name USB-RSAQ2

OS Windows98 (OS which supports USB is necessary.)

Computer GateWay model GP6-400(CPU-P2) Memory 64MB

Caution!

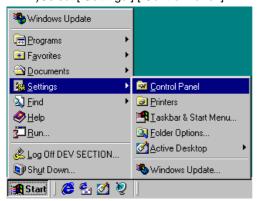
It is confirmation in above-mentioned configuration.

It is not guarantees of function of your computer.

Please confirm to the maker about driver for Windows 98SE, 98me, NT4.0, 2000.

Install

- 1)Please Start Windows.
- 2)Select [Settings] [Control Panel].



3)Select [Add/Remove Programs].



Add/Remove Programs

4)Select PC Link and click [Add/Remove]Button.



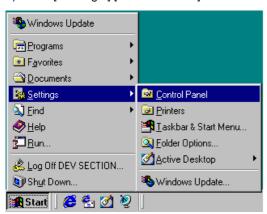
5) Set PC Link floppy disk No1to the floppy drive. Click install button.



Please according to the display messages.

Uninstall

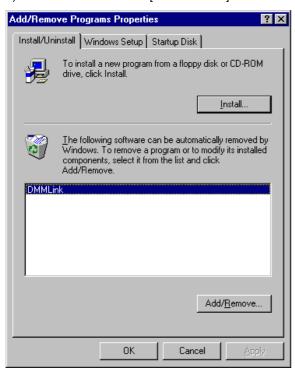
1)Select [Settings] [Control Panel]



2) Select [Add/Remove Programs].

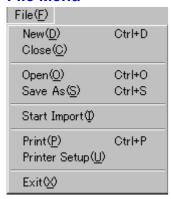


3)Select PC Link and click [Add/Remove]Button.



Menus

File Menu



[New]

Create a new Data File.

[Close]

Close an opened File.

[Open]

Open a saved data File. (CSV file)

[Save As]

Save a data to data file. (CSV file)

[Start Import]

Import PC520M memory data to the computer.

[Print]

Print a Graph.

[Printer Setup]

Open a Printer setup Window.

[Exit]

Exit to the Disk Top.

Edit Menu

Otrl+X
Otrl+C
Otrl+V
Shift+Del

[Cut]

Cut a selected data in the Data Log Box then copy to the Clipboard.

[Copy]

Copy a Data in the Data Log Box to the Clipboard.

[Paste]

Paste the Clipboard Data into a Data Log Box.

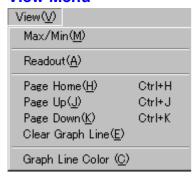
[Copy Graph]

Copy a Graph to the Clipboard.

[Delete all Data]

Delete all Data.

View Menu



[Max Min]

Display maximum and minimum value window of acquired data with date and time.

[Readout]

Display Readout window.

[Page Home]

Display top page of the graph.

[Page Up]

Scrolls the graph to next page.

[Page Down]

Scrolls the graph to back page.

[Clear graph line]

Erases the plotted line in the graph.

[Graph Line Color]

Change a Graph Line Color.

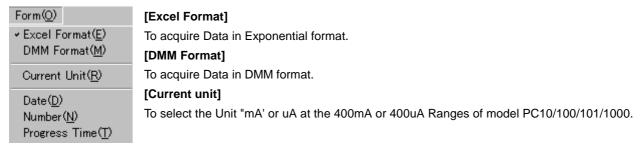
Acquisition Menu



[Manual]

To manually Data Acquisition.

Form Menu



[Date]

To add a Date to the Data.

[Number]

To add a Number to the Data.

[Progress time]

To change time form to progress time.

Port Menu

Port(<u>D</u>)	[Set]
Set(<u>V</u>)	To set Com Port Number and model type.

Intervals Menu



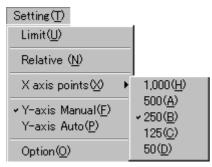
[Hour]

To set an Acquisition Time Intervals Unit to the Hour.

[Manual]

To get Data by Mouse Click or Short Cut Key.

Setting Menu



[Limit]

To set Upper.or Lower Limit Value into the [Upper] or [Lower] Box in the Limit frame.

[Relative]

To set Reference Value for a Relative Measurement.

[X-axis points]

To appointment X-axis plot number.

[Y-axis Manual]

To set Y-axis scale in a Graph pane manually.

[Y-axis Auto]

To set Y-axis Scale for the DMM's Full Scale automatically.

[Option]

Save

When use [New] Command, you can create Auto Backup file.

Temp unit

It can be settled by only model PC510/520M

Please set effective when measurement is begin from 1000 oF or more.

Please cancel setting after measurement.

Excel

When data are transferred to Excel, you can select whether include file information or not.

Accessory Menu

[Sensor]

Select optional sensor for DMM.



- 1. T-300PC Temperature probe
- 2. CL33DC DC Clamp current probe(30,300A)
- 3. CL-22AD DC/AC Clamp current probe(20,200A)
- 4. CL-20D AC Clamp current probe(20,200A)

Excel Menu



[Export to New Book]

New Excel book is opened as transfer target of measuring data.

[Stop Export]

[Export to New Book] and [Export to File] commands can not use, when close Excel without no data transfer. If you use this command then you can use [Export to New Book] and [Export to File] commands.

Help Menu



[[Index]

To display Help Index.

[Topics]

To display Topics of Help.

[SANWA Web page]

To display SANWA Web page.

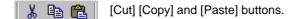
[About PC Link]

Displays the version number of this application.

Window

Toolbar/Button





E M [Excel Format] and [DMM Format] buttons.

Start] [Stop] and [Manual] buttons.

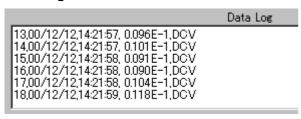
[Delete all data] and [Delete Graph line] buttons.

[Page Home] [Page Down] [Page Up] buttons.

[Export to New Book] and [Stop Export] buttons.

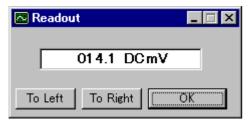
Controls

Data Log Box



Display an acquired Data and Time Stamp.

Readout window



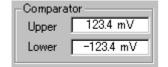
This window displays all of the data from DMM regardless of the interval time.

Progress bar



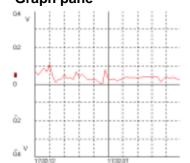
When data acquisition, display remainder capacity of data buffer. (Except use New command.)

Comparator Frame



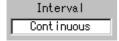
Display the Upper and Lower Limit.

Graph pane



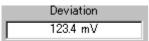
Display a Graph.

Interval Box



Display the Acquisition Time Interval.

Relative Box



Display the Relative Value.

Status Bar

Display Com Port status, Elapsed Time and Page Number of Graph.

Quick Guide

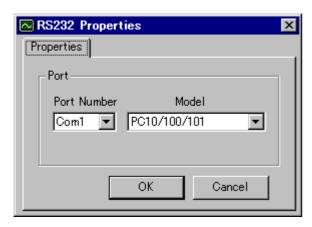
Getting data from DMM

Connect your DMM to the PC using the cable.

- 1) Connect your DMM to the PC using the cable.
- 2) Open the PC Link.
- 3) Set the DMM selector switch to as you desired function.
- 4) Select the "Port" command from the menu.
- 5) Select the "Set" command.



Select the DMM Model and Com port number.



- 6) Checked port is valid.
- Click by mouse and select the port number and model of a valid port.

Note.

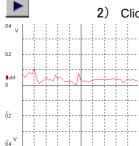
You cannot get data, if you set incorrect port number.

You cannot get the data if you set incorrect model.

Acquire Data



1) Make sure the "Interval" box displayed **Continues**, If not, select "Second" command in the "Interval" menu, and then enter **0** to the Interval dialog box and press **OK** button.



- 2) Click the "Start" button in the Toolbar by the left mouse button.
 - 3) PC Link window begin displaying.

- 4) When you click the "Stop" button in the Toolbar, PC Link will stop the data acquisition.

3 Troubleshooting

[Com Port Number Error] dialog appears when you click the "Start" button

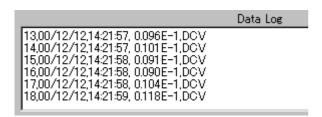
Try another Com Port.

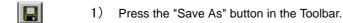
Can get the Data, but no Graph display

Check the "Y-axis Auto" in the "Setting" menu check mark, if not marked, click it by mouse left button.

Saving data

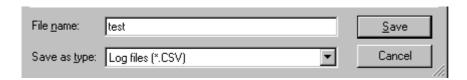
You must be done previous page (Getting data from DMM) practices before proceeding this, and then the Data Log Box should be displayed as a drawing below (displaying data will be defer than you got).





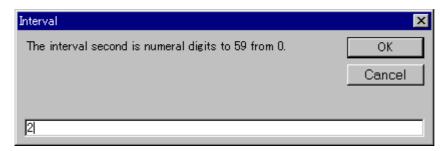


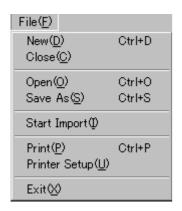
 Select a directory and type a file name into the [File Name] box in the [Save As] dialog box, and then press [Save] button.



Getting data by tow seconds interval with saving to file

- 1) Click the "intervals" and "Second" command in the menu bar.
- 2) Type [2] into the text box, and then press [OK] button in the [Interval] dialog box.





- 3) Click the "File" and "New" command in the menu bar.
- 4) Select a directory and type a file name into the [File Name] box, and then press [Open] button in the [New] dialog box.

- \blacktriangleright
- 5) Press the "Start" button in the Toolbar.
- 6) When you finished a Data acquisition, Press the "Stop" button in the Toolbar to stop a acquisition.
- 7) Click the "File" and "Close" command in the menu bar. The acquired data will be saved to the file automatically.

Display saved data by spread sheet application

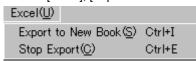
- 1. Open the spread sheet application which you have.
- 2. Open the file that you saved Data file.
- 3. Refer to your spreadsheet application user's manual for a making graph.

Getting data to Excel directly

NOTE!!

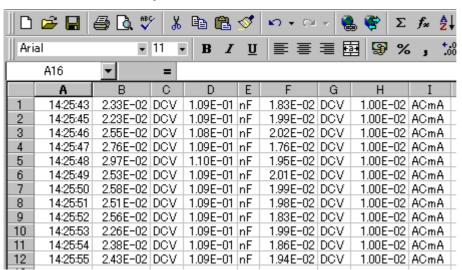
When you proceeding this practices, MS-Excel must be installed in your PC

1. Click [Excel], [Export to New Book] command in the Menu bar, Excel will be open automatically.



- 2. Press [Start] button in the Toolbar, and then a acquired data transferred Excel directly.
- 3. When you finished acquisition, press [Stop] button in the Toolbar to stop acquisition.
- 4. Save the file by Excel command.

<Excel data transfer example>



Use Temperature probe, Clamp probe

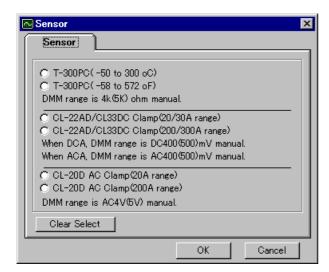
Note!

Please cancel sensor selection when a probe is not used.

If not canceled, abnormal value displayed at the time of a voltage or resistance measurement.

Note!

If the large relative value was selected in Clamp probe measurement, unit of data change from dcA or acA to mV or V. In this case, please set more small relative value or change more large range.



T-300PC Temperature probe (Optional accessory)

Measurement temperature range is -50 to 300 degrees centigrade(C) or -58 to 572 degrees Fahrenheit(F).

- 1. Set DMM to 4k(5k) ohm range.
- 2. Connect probe to DMM.(ohm and COM terminal)
- 3. Set T-300PC.(Select degrees centigrade(C) or degrees Fahrenheit(F))
- 4. Close this dialogue and start measurement.

Note!

In temperature measurement, display of DMM can not read direct as temperature value, but your computer can display as degrees centigrade(C) or degrees Fahrenheit(F).

CL33DC DC Clamp Current probe (Optional accessory)

Measurement current range is up to DC300A.(DC30/300A ranges)

- 1. Set DMM to DC400(500)mV range.
- 2. Connect probe to DMM.(V and COM terminal)
- 3. Set CL33DC.(Select 30 or 300A)
- 4. Close this dialogue.
- 5. Select [Setting] select [Y-axis manual].
- 6. Set Graph Y-axis scale and start measurement.

CL-22AD DC/AC Clamp Current probe (Optional accessory)

Measurement current range is up to 200A.(20/200A ranges)

- 1. Set DMM to 400(500)mV range.(At DC current set to DC400(500)mV, At AC current set to AC400(500)mV.)
- 2. Connect probe to DMM.(V and COM terminal)
- 3. Set CL-22AD.(Select 20 or 200A)
- 4. Close this dialogue and start measurement.

CL-20D AC Clamp Current probe (Optional accessory)

Measurement current range is up to 200A.(20/200A ranges)

- 1. Set DMM to AC4V(5V) range.
- 2. Connect probe to DMM.(V and COM terminal)
- 3. Set CL-20D.(Select 20 or 200A)
- 4. Close this dialogue and start measurement.

Note!

In current measurement, unit of DMM display is V, but your computer display A (ampere).

Get all data from remote DMM via LAN

You can get data from remote DMM via LAN.

The computer, which connected DMM

- *The holder which makes data files set to shared folder.
- *Open PC Link.
- *Click [File] menu and select [New] command.
- *Make new data file in the shared folder.
- *Press start button.

The computer, which collect data

- * Open PC Link.
- * Click [Settings] and select [Y-axis Manual] command.
- * Click File and select [Open] command.
- * Select Network computer.
- * Select computer name which connected DMM.
- * Open data file in the shared folder.

Data can be indicated a graph.

It is also possible to save in other name.

Note!

You must set Y-axis Manual mode because maximum and minimum data are not implied in collection data.

Specifications

System requirement

Support Models

PC10, PC20, PC20TK, PC100, PC101, PC500, PC510. PC500M, PC1000, PC5000

Note.

9999uF ranges of PC500, 510, 520M, 5000 cannot be used by PCLink.

Operating Systems

Windows95 (Built 708 or later) (IE 4.01 or later)

Windows98, Windows98 Second Edition, Windows98 Millennium Edition

WindowsNT4.0 (Built 1381 and Service pack 3 or later) (IE 4.01 or later)

Windows2000

CPU

Pentium200MHz or higher

Memory 64MB or higher

Celelon300A MHz Memory 64MB or higher recommended.

Display Resolution

800 x 600 or higher

Port

RS232C port

Free Hard Disk Space

About 10MB

Maximum Recordable Data

Save to File Command: 20,000 rows data Max in the data log box.

New Command: Depends on your free disk space.

Trouble shooting

Q1.Can not install PC Link software from floppy disk.

Stop other all other applications. (For example virus check software etc.)

At the time install PC Link, please stop all application.

Q2. Data can not get from DMM.

Please confirm serial port settings of Windows.

Select [Control Panel] [System] [Device manager] and check Port condition.

Please check port number.

At the computer with multiple port, if you set not used port number then no error message occur.

Please confirm model type setting of PC Link.

Select [Port] [Select model] and check selected model type.

Q3. Data can not get from DMM, when use note book type computer.

If you use notebook type computer, please make sure that COM port is selected in the Bios on board serial port setup.

If either IrDA or other mode is selected and you do not know how to change the Bios setup, please ask the manufacturer of your computer.

Q4. [Com Port Number Error] dialog appears when you click the "Start" button.

Try another Com Port by [Port] [Set] command.

Q5. When DMM set to DCV function, data can not get by computer.

A range continues sometimes to repeat up-and-down movement between mV and V in the case of auto range.

While a range is moving, data is not outputted from DMM.

Please try to connect the test probe to the measuring object or turned into a manual range.

Q6. Can get the Data, but no Graph display

Y-axis setting may not be appropriate.

Check the "Y-axis Auto" in the "Setting s" menu check mark, if not marked, click it by mouse left button.

Q7. Can not get long term data, because PC100/101 auto powered save is on.

Press the 0-I switch of DMM, and turning function switch.

This operate disables auto power save function.

Q8. Even though measuring value excess limit, does not sound from computer.

Click [Setting] and select[Comparator].

Please check "Beeper(sound)ON".

Q9. When installed 2bytes character set Windows (For example Chinese Windows), A letter of AM, or PM is not indicated normally.

Please set windows time style from tt.hh:mm:ss to HH:mm:ss.

- 1.Click Windows Start menu.
- 2. Select Settings.
- 3. Select Control Panel.
- 4. Select Regional Settings.
- 5. Select time tag.
- 6. Change time style from tt.hh:mm:ss to HH:mm:ss.
- Q10. Don't work on Windows95, WindowsNT4.0?

Windows95 Install of Internet Explorer 4.01 or later is necessary.

WindowsNT4.0 Install of Internet Explorer 4.01 and Service Pack 3 or later are necessary.

FAQ

Q1. How much size data can be collected?

If you use [Save As] command.

Save to File Command: 20,000 rows data Max in the data log box.

If you use [New] command.

This file's size is limited only by available space of the hard disk storing the file.

Caution.

When data size is too large, the Excel cannot read file.

The maximum data sell differs by version of Excel.

Calculation of total data bytes

<Example 1 cannel measurement>

A number of 1 line character in the data log box + 2 = 1 line bytes.

When 1 line character in the data log box is as follows.

13:28:40, 0.106E-1,DCV (22 + 2 = 24 bytes include space ,comma etc)

If data acquisition Interval = 1 sec, and acquisition term = 10min.

Total bytes = 60 * 10 * 24 = 14,400 bytes

Q2. I hope to know output form of data from DMM, and data acquisitive ways.

It is possible programing as for PC10, PC100, PC101.

If you want to make your own program, please refer Micro Soft Visual Basic Ver5, 6 or Visual C++ Ver6 terminal program sample.

[Vb Term] or [Vc Term] sample program can get data from DMM, without changing program.

Q3. Battery life of PC100/101?

(DCV function)

Approx 100Hr(manganese battery)

Approx 1/2 month(alkaline manganese battery)

Approx 1 month(1.5V type lithium battery)

Q4. Specification of RS-232C extension cable?

Please use straight type.

Q5. How to change year form from YY to YYYY?

Please set windows Short date style from M/d/yy to M/d/yyyy.

- 1.Click Windows Start menu.
- 2. Select Settings.
- 3. Select Control Panel.
- 4. Select Regional Settings.
- 5. Select Date tag.
- 6. Change Short date style from M/d/yy to M/d/yyyy.

Make software

Programming information

There are sample program in this CD-ROM.

Sample program was made by Microsoft Visual Basic professional edition.

Note.

You need to prepare Microsoft Visual Basic.

Support of a sample program is impossible.

License and Copyright

License

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- -User shall not rent, lease, sell, sublicense, assign or otherwise transfer this software product to the third person.
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