

PC QM-1577 Series Scope Meter
USB/RS232 Computer Interface Software
User's Manual

INTRODUCTION, SAFETY AND WARNINGS

PC QM-1577 series scope meter can communicate with PC and the waveform and digits can be sent to PC. The waveforms and the digits can be displayed on PC's screen and stored, printed and also copy/pasted to other PC program through the clipper.

The function of the USB/RS232 interface is to connect PC QM-1577 series scope meter and PC. And the PC QM-1577 softer ware is to process the data upload from scope meter. Both the interface and the softer ware can be used for entire series of PC QM-1577,

USB/RS232 interface cable has two plugs. One of the plugs connects to the meter and another to the USB or RS232 jack on the PC. As the difference of connection, the interface is named as USB or RS232 interface cable.

The interface cable is optically isolated. With this technique, the operator's personal safety as well as PC is protected effectively; and the disturbance due to the connection of scope meter and PC may also be reduced.

Isolation Voltage of the interface cable is 250 V AC RMS, 1min, R.H. $\leq 60\%$.

WARNING	The electrical potential between the meter and PC is NEVER surpasses the limitation of insulation Voltage. In communication status, DO NOT test the Voltage lager than 500V AC+DC RMS.
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CAUTION	On the items of safety of scope meter please refer to the User's Manual of PC QM-1577 series.
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The International Safety Symbols





	This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.
	This symbol adjacent to one or more terminals identifies them as being associated with ranges that may, in normal use, be subjected to particularly hazardous voltages. For maximum safety, the test leads should not be handled when these terminals are energized.
	Double Insulation (Protection Class)
	This symbol advises the user that the terminal(s) so marked must not be connected to a circuit point at which the voltage, with respect to earth ground, exceeds (in this case) 500 VAC or VDC.
CAUTION	The CAUTION symbol indicated a potentially hazardous situation which, if not avoided, may result in minor or moderate injury
WARNING	The WARNING symbol indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death

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INSTALLING THE INTERFACE PROGRAM

System Requirements

To use PC QM-1577 series Interface Program, you need the following hardware and software:

- An IBM PC or equivalent computer with Pentium 4 or higher processor and 1024 x 768 pixel or better monitor.
- Microsoft Windows 98 or above.
- At least 64MB of RAM.
- At least 20MB free space in hard drive.
- A local or a network CD-ROM.
- A free USB port, for USB interface cable, or an RS232 port, for RS232 interface cable.
- A mouse or other pointing device supported by Windows.

Install USB interface driver

- Insert the provided CD-ROM into CD-ROM drive.
- Double-click the My Computer icon from the Windows desktop.
- Locate the CD-ROM drive from the window and double-click the drive letter to display the folder of 'USB driver'.

A. Find adaptable OS to your computer equipment, e.g. CP210x_VCP_Win2K_XP_S2K3.exe, double click it.

B. If your computer equipment is running Windows OS that the pop-up screen of installing message will be showed as 'CP210x VCP Drivers for Windows 2000/XP on your computer' and then to Click 'Next' icon for going to next step.

C. After reading the license agreement then if you agree the terms to choose the item 'I accept the term of the license agreement'. Choose "Accept" item of license agreement.

D. Then you should choose destination location is for saving the CP201x driver software in destination location of computer.

E. Next, execute the program installation. Click the "install" icon to begin installation of CP210x driver.

F. Install CP210x VCP Driver for Windows 2000/XP. After click "Install" icon, the install shield wizard is installing Silicon Laboratories CP210x drivers for Windows 2000/XP and installation location.

G. Install Shield Wizard Complete. CP201x VCP driver has successfully installed and click "Finish" icon for exiting the wizard.

After the installation, when USB cable has successfully connected, you can check the details of the virtual communication port.

A. Into "Manage" icon in My Computer.

Click "My Computer" icon and then press the right side button of mouse. After you click the manage item on list bar then "Computer Management (Local)" list will be pop-up.

B. Choose "Device Manager" and click "Ports (COM & LPT)" in Device Manager.

Click "Device Manager" item, all devices of computer will be list on right site of screen and then click "Ports (COM & LPT)" item for looking for more COM devices.

C. Detail parameters of CP210x USB to UART Bridge Controller

Click "CP210x USB to UART Bridge Controller" for getting more detail information of the device.

NOTE	RS232 cable doesn't need driver program.
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Connect scope meter to a PC

Connect the meter to the PC using the supplied communication cable. The TRS (tip/ring/sleeve phonon plug) end of the cable connects to the meter (top) and the USB connect plug to a USB jack of PC (for a USB communication cable) or 9-pin plug connects to the PC serial port (for an RS232 communication cable).

Pull out and plug in when communication carries on

To avoid data error, don't plug in and pull out interface cable when communication carries on.

For an RS232 interface cable, pull out/plug in the RS232 cable will lead data error. After RS232 cable properly plugged again, the transport will resumed correctly. Unless the plug is inserted to another RS232 port, user doesn't need to reselect communication port in QM-1577 program.

It is quite difference for an USB cable. Once the plug of USB pulled out, not only the data transport will be ceased but also PC will delete the virtual serials COM port. When insert the interface again, the Windows system will check, identify, and assign resource to the interface to the virtual serials COM port again. So, although the newly assigned virtual COM port has the same number as the old one it still need to be initialized. Otherwise it is unable to transmit the data normally.

In summary, once pull out/plug in happens the connection should be broken by click the communication control button on the toolbar and wait a while after the cable connected properly for Windows system checking and reassigning the virtual COM port and then click the button again to search and initialize the virtual COM port to let the communication back to normal.

NOTE	If the bad contact causes the communication short interrupted, the consequence and processing is as that.
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INSTALLING AND OPERATION PC QM-1577 INTERFACE PROGRAM

Installing PC QM-1577 Interface Program

To install PC QM-1577 Interface Program, please follow below procedure:

Before install the interface program, make sure that the computer is running the Window 98 or above operating system.

1. -Insert the provided CD-ROM into CD-ROM drive.
 - Double-click the My Computer icon from the Windows desktop.
 - Locate the CD-ROM drive from the window; double-click the drive letter to display the folder of PC QM-1577.
 - Double-click the file Setup.exe
2. Follow the on-screen installation instructions.
3. The installation program will create a PC QM-1577 Interface Program folder.
4. Then you can create a shortcut icon on the desk for the PC QM-1577 (recommend).

Getting Started with PC QM-1577 Interface Program

To run the PC QM-1577 Interface Program, please do the followings:

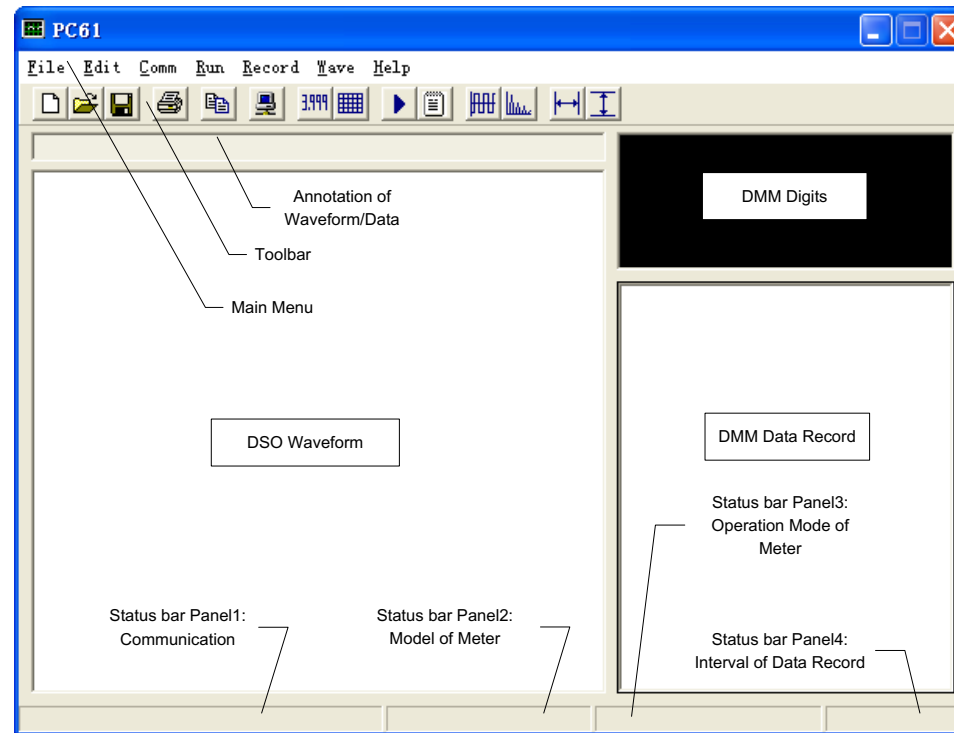
1. Insert the supplied USB/RS232 interface cable into the jack at the top of the meter and properly connect the other end of the cable to a USB or serial port of computer.
2. From the Windows Start menu, choose Programs > PC QM-1577 A > PC QM-1577.

When it starts, PC QM-1577 will search for the available communication port and cable automatically. Once an available communication port and cable are found, PC QM-1577 will setup the connection between PC and meter automatically.

Not: with USB cable, after plug the cable to PC, user should wait a moment (several to dozens seconds) and to give Windows system enough time to check, identify, and assign resource to the interface. And then start PC QM-1577 program.

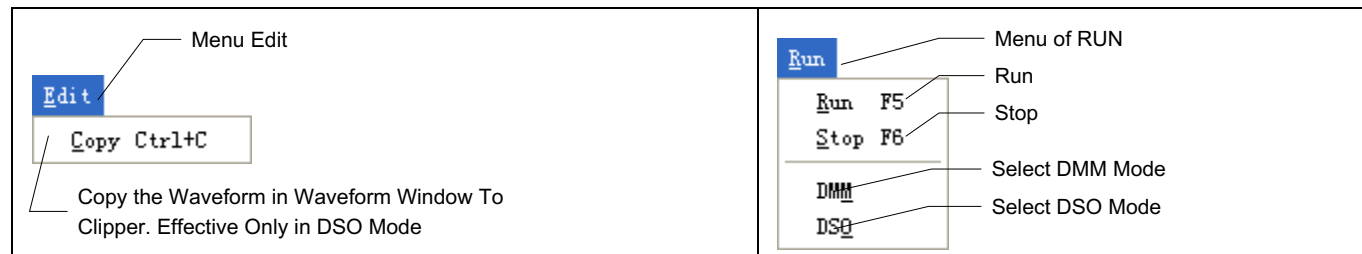
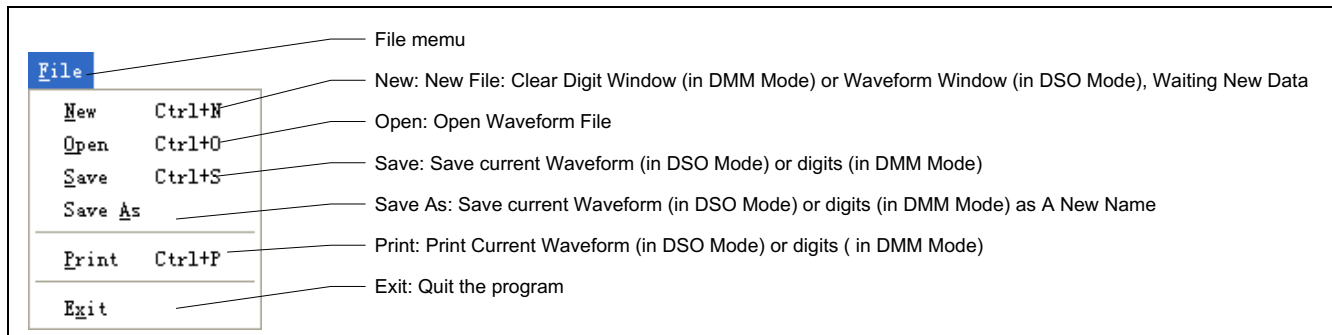
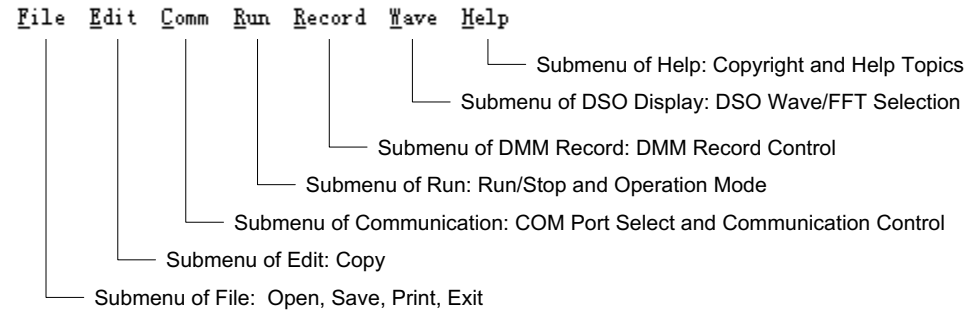
Without connection, PC QM-1577 can open and observe the waveform saved in PC data file.

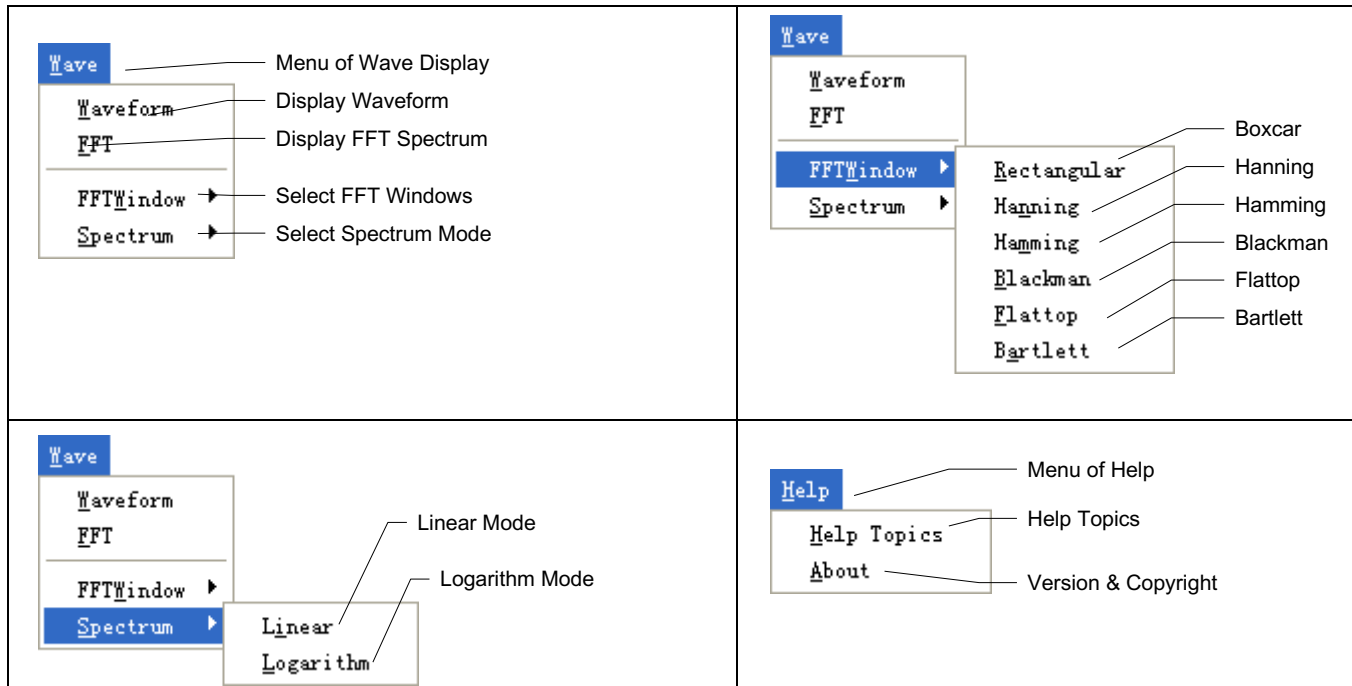
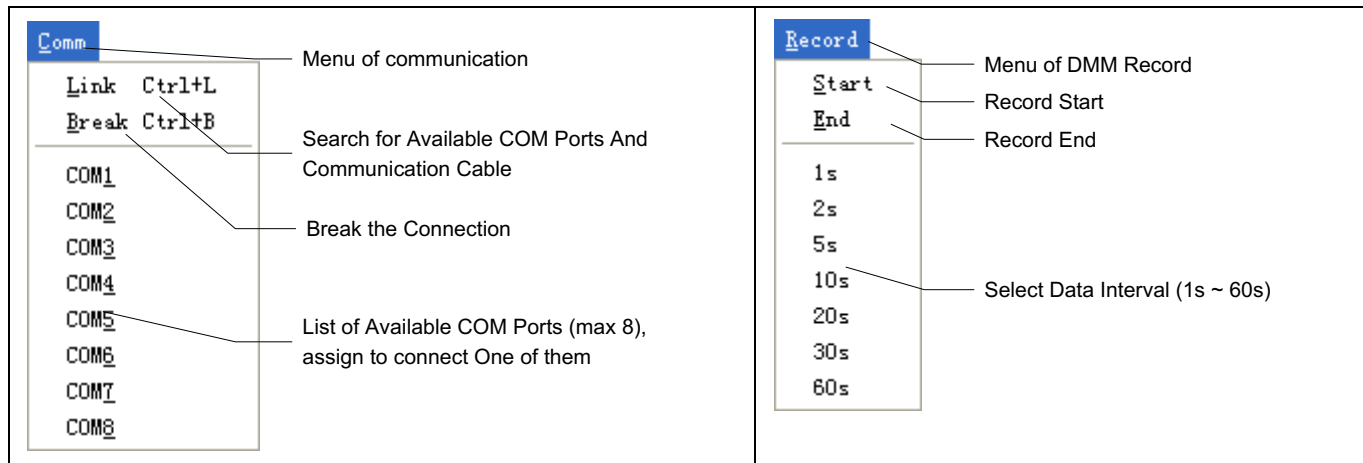
PC QM-1577 window arrangement



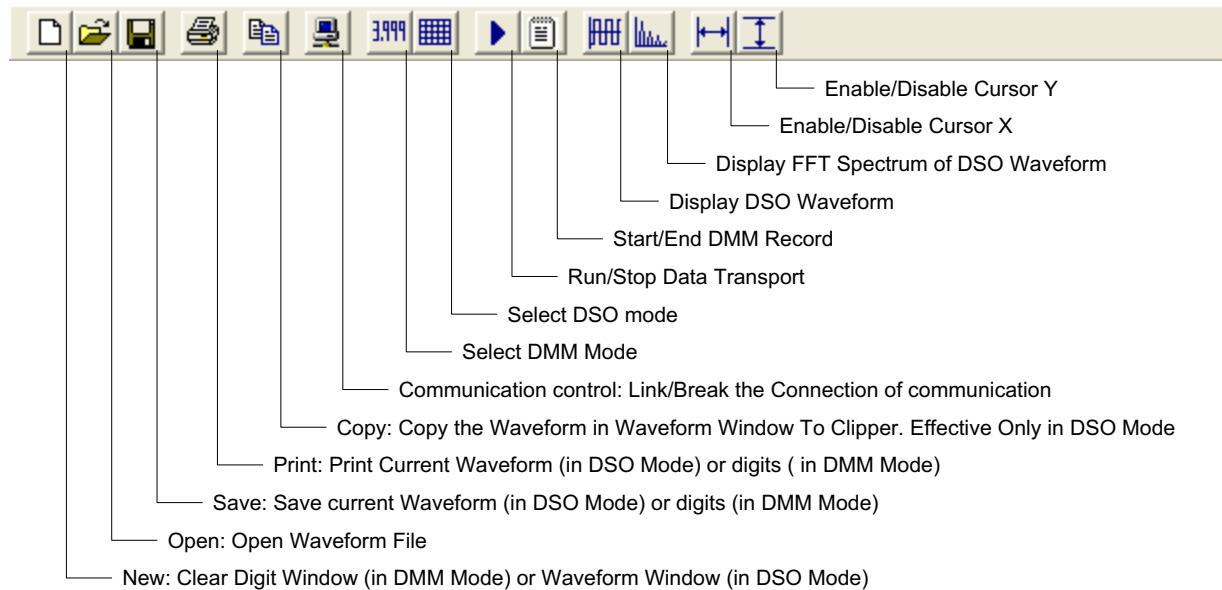
PC QM-1577 menus and control buttons

Basic selections and their functions of main menu






Push button on PC QM-1577 tool bar




File save/recall and Title block of data

The waveform or data can be saved in PC. To save these file, user can select 'Save' or 'Save As' in sub menu 'File', or click button  on the toolbar.

The contents of DMM record file are the same of the DMM record window. In addition, at the beginning of the file, the information of the model of the meter, the date and time of saving, the source of data (current sampling or database), the annotation, and the mark of 'End of data' at the end of the file. The contents of DSO waveform file include the data of waveform, the model of the meter, the date and time of saving, the source of data (current sampling or database), and the annotation.

Not, the data and time is the date and time of saving, not the collection of the data.


The file format of DMM record is the commonest '.txt', any word edit tool can open it. The extension of DSO waveform file is '.dso' that can only be opened with PC QM-1577.

To open the DSO waveform file, select the Open in submenu of 'File' or click the button  or use so called 'Drag and drop' function, drag the file that you want to open to the DSO waveform window. For the DMM record file, user can open it with common word edit tool, e.g. notepad, that more conveniently.

To keep the notes with the data, PC QM-1577 has the function of annotation. Witch is located at the top of DSO waveform window. User can inter the content and edit it directly. The largest length is 50 characters. Those characters can be as title printed or saved at the head of data file. When the file is opened, those characters can be displayed in the annotation panel.

Communication control

To set the connection between PC QM-1577 and the meter, please connect the cable correctly according the method in former chapter. If you use USB cable, please install USB driver first. When PC QM-1577 start, it will search available COM ports automatically. If find available COM port and that connected cable, PC QM-1577 will setup communication with the meter through this COM port.



The button  can set/break the communication. When the button is clicked, PC QM-1577 will search available COM ports and cable again and setup the communication, just as the start of PC QM-1577. The communication status is displayed on 1st panels of the status bar at the bottom of form of PC QM-1577.

After setting up of communication, click the button again, connection will be broken.

The operation of the connection can also be controlled with the selection 'Link' and 'Break' of submenu 'Comm'.

In the submenu 'Comm', there are selections of 'COM1' ~ 'COM8' representing serial communication ports COM1 ~ COM8. PC QM-1577 can search available COM ports in this range when it starts or the button is clicked and set the connection with the COM port that found firstly. If you want to use another available COM port, select it in this submenu.

Operation mode selection


The PC QM-1577 series scope meter have tow operation modes: DMM and DSO. PC QM-1577 A has also two modes correspondingly. The button  and  on the toolbar can select current operation mode of PC QM-1577. The mode can also be changed with the selection 'DMM' and 'DSO' of submenu 'RUN'.

Since the data format is difference between the two modes, the transportation can get Carrie on only when the meter and PC QM-1577 have the same operation mode. the mode and data format should be the same. The operation mode of the meter is displayed on 3rd panels of the status bar at the bottom of form of PC QM-1577

If difference of mode is found, a message window will pop-up. The user can decide if change the mode to the same as the meter.

Display DMM measurement results

The first operation mode is DMM mode. Communication in DMM mode can upload current result of the measurement of meter to PC. Because of the delay of upload, the digits displayed on PC QM-1577 will be later than the meter

The button  on the toolbar controls the start/stop of transport. Click this button be stopped. So, this button has the function of data hold.

The start/stop can also be controlled with the selection 'RUN' and 'STOP' of menu

In the course of communication, PC QM-1577 will never stop renew the digits even the meter in data HOLD status and the digits are the same as data in the Dynamic Data Window, a small window on the right top of the meter's LCD.

If the meter displays digits in relative mode, the PC QM-1577 also displays relative volume. And the P-H, conductivity, dB etc. will not be displayed on PC QM-1577



current result of the measurement of meter to PC. Because of the (refer the figure at right).

the display will be renewed continuously. Click it again the change will

'RUN'.


NOTE

About other operations of scope meter please refer to the User's Manual of PC QM-1577 series.

Record of DMM measurement results

Communication in DMM mode can upload data of measurement to PC.

In DMM mode, if DMM data record start the digits in DMM digits window can be printed.

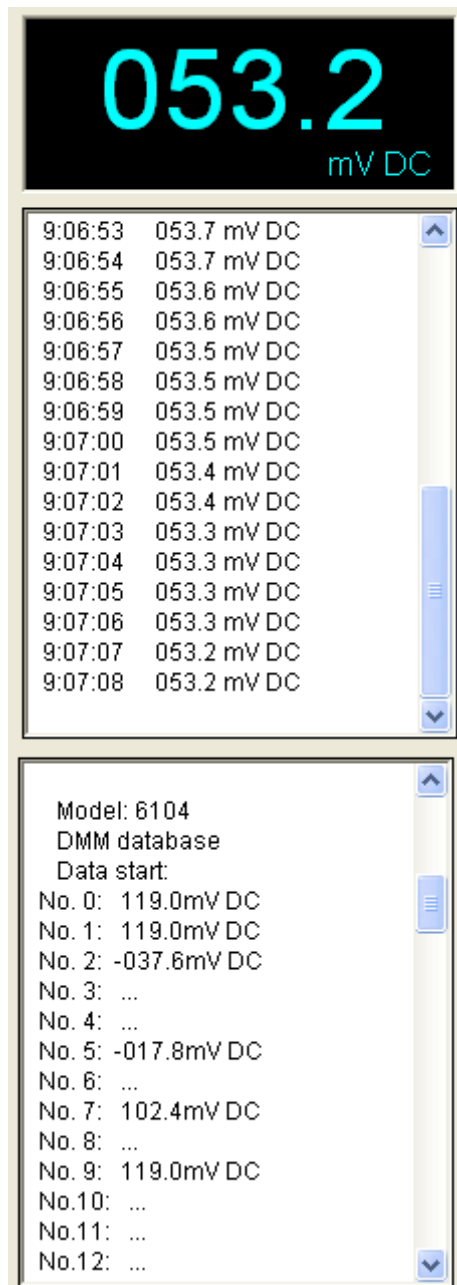
The button  on toolbar can control the record function. Click this button the record the record will stop. The record can also be started and ended with the selection of The record interval can be selected between 1 ~ 60 seconds. The current selection is PC QM-1577.

The figure at the right is a sample of data record. The contents of record include time, copy/paste to other PC program through the clipper.

Read the data of DMM database upload by scope meter

With communication function in DMM database, user can upload all data to PC Before PC QM-1577 receive the data from DMM database, just set PC QM-1577 to can begging and then the data in database of the meter will be displayed in the DMM As the upload carries on, the DMM digits window will display the progress. The

Before upload start, user has better clear the DMM data record window of PC QM-1577, database.



recorded in certain time interval. The data record can be saved and

will star and the data displayed in window. Click this button again menu 'DMM record'.

displayed on 4th Panels of the status bar at the bottom of form of

digits and their units. All of them can be saved, printed and

completely.

DMM mode and let DMM record start. When that is done the upload data record window.

complete upload process probably needs ten seconds.

by press the button of  to get a 'clear' list of the meter's



The figure at left demonstrates the upload result. The displayed contents include the Serial number of data, digits and their units and the empty record item is marked with '...'.

Display DSO waveform from scope meter

Connect the meter and PC and select DSO mode and operate the meter upload, you can get curves from meter. These curves can be displayed (refer the left figure), saved and printed.

The transportation of one curve needs several seconds. As the upload carries on, the DMM digits window will display the progress. If the meter is operating in DSO mode the waveform will be uploaded continuously and the waveform on PC QM-1577 will be the scan need quite long time, the renew rate of the

PC QM-1577 can measure the curves automatically

The button  and  or menu options be used select the display mode.

PC QM-1577 can Discrimination whether the data is the different annotation to different data. E.g. if the data is Annotation is 'Meter 6104 DSO sample'. And for the 'Meter 6104 DSO database No. ____'. User can change Whether the data is collected at any time, the date and uploading. So, if the data upload tow times at different time.

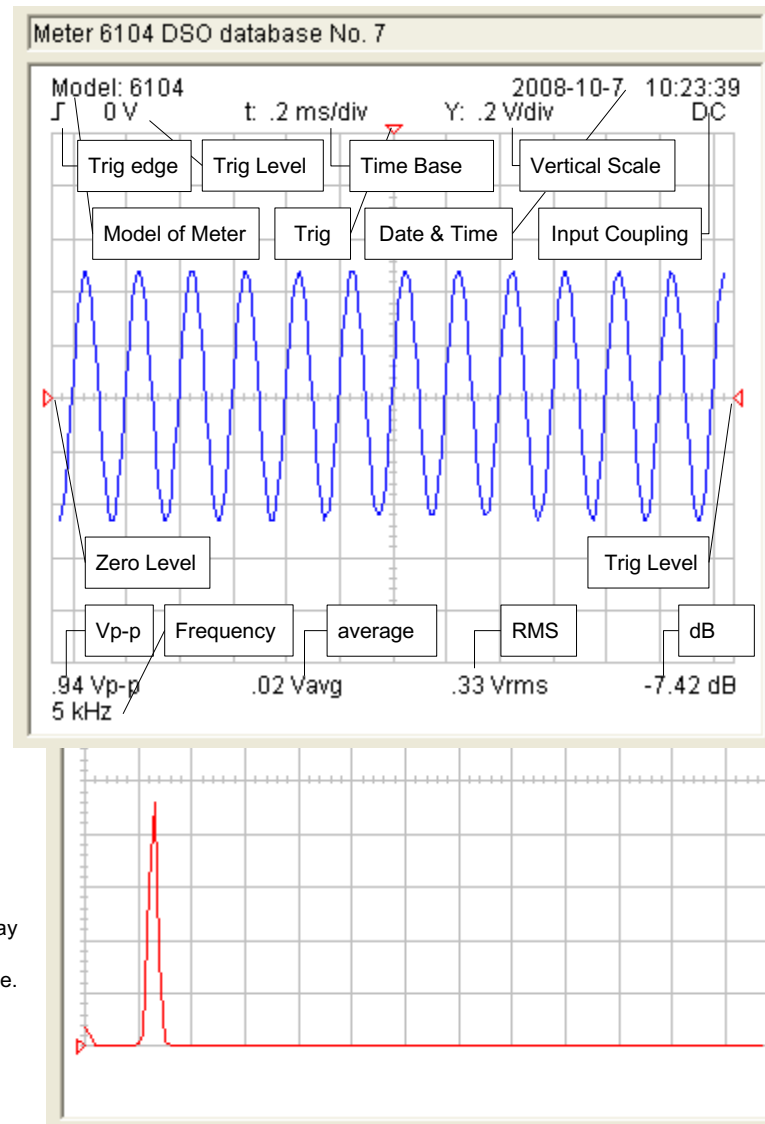
Display DSO waveform of PC file

To open a data file, select the menu options or click the the waveform will be displayed on the DSO waveform Please not that the date and time in data file is the not changeable.

Display the FFT spectrum of DSO waveform

In DSO mode, click button  or 'FFT' in DSO display

The spectrum can be displayed in linear or logarithm mode. In logarithm mode, 0dB = 1 VRMS.



renewed continuously. When the meter is in slow scan status, as waveform in PC QM-1577 will also be prolonged. and user can also measure the curves by cursors.

'Waveform' and 'FFT' under the menu of 'DSO display select' can

results of current collection and the data in database and adds the the results of current collection upload from a 6104 model default same meter's data in database, auto named default annotation is the annotation as the needs of themselves.

time recorded on the data file is always the data/time of date and time, will cause tow data file with different date and

button on the toolbar or 'drag and drop'. When a file is opened window, and can be saved as, printed and be performed FFT. date/time of uploading. The date/time recorded in a data file is

submenu to select FFT spectrum display (refer the left figure).

That can be selected under the spectrum display submenu.

About FFT Window

Windows reduce spectral leakage in the FFT spectrum due to a window can change the waveform so that the start and stop values are close to each other.

Hanning is the most commonly used window function for random signals because it provides good frequency resolution and leakage protection with fair amplitude accuracy. If you don't know the characteristics of signal, might as well starts from the Hanning window. So the default select is Hanning.

PC16 sports 6 different windows, each with its own advantage and disadvantage relative to the others. Some are more effective for specific types of signal types such as random or sinusoidal. Some improve the frequency resolution, that is, they make it easier to detect the exact frequency of a peak in the spectrum. Some improve the amplitude accuracy, that is, they most accurately indicate the level of the peak. The best type of window should be chosen for each specific application.

The windows PC QM-1577 sported and their features are given below.



Window	Best for these Signal Types	Frequency Resolution	Spectral Leakage	Amplitude Accuracy
None(boxcar, Rectangular)	Transient & Synchronous Sampling	Best	Poor	Poor
Hanning	Random	Good	Good	Fair
Hamming	Random	Good	Fair	Fair
Blackman	Random or mixed	Poor	Best	Good
Flat top	Sinusoids	Poor	Good	Best
Barlett	Random	Good	Fair	Fair

About FFT alias

If the scope meter acquires a time-domain waveform containing frequency components that are greater than the Nyquist frequency, the frequency components that are above the Nyquist frequency are undersampled, appearing as lower frequency components that “fold back” around the Nyquist frequency. These incorrect components are called aliases.

Cursor Readout Function in DSO mode

The cursor function can be used to measure voltage difference (ΔV) or time difference (Δt) between two cursors on screen. In FFT spectrum mode, frequency difference (Δf) or amplitude difference of spectrum (ΔF) also can be measured.

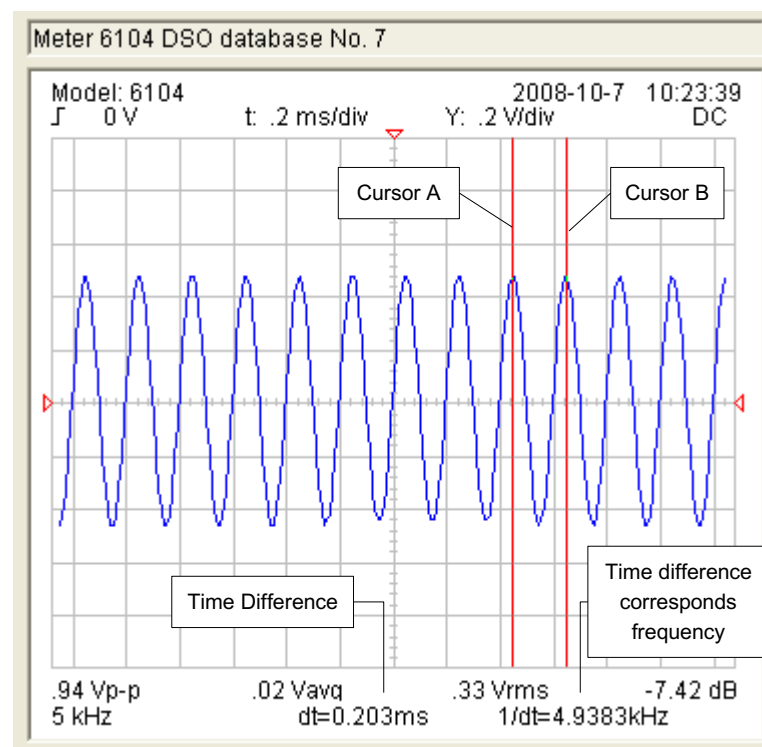
There are tow buttons  and  on the toolbar. These buttons control horizontal and vertical cursor. The buttons are Invalid if there is no waveform in DSO waveform window and available when waveform in the window.

When operator want to use cursor function, first click these button and then click any point in the waveform window to get the cursor. Click With left button on the mouse to get a cursor and right to another. Two cursors are the same, no difference of rank. The results of cursor measurement are displayed on the bottom of the waveform window immediately.

Click again in other place on the window can get a new cursor and the old cursor will disappear. As the cursor shifted the results of measurement will change momentarily.

The cursors are not always a pair. Operator can use causes only one cursor. Single cursor can be used to on the toolbar again.

If COPY or PRINT happened when the cursor is on printed.





only one of them by just click one of left or right button of mouse that measure the amplitude on the curve. To close cursor click the button

the cursor and the results of measurement will also be copied and

COMMUNICATION OPERATION ON SCOPE METER

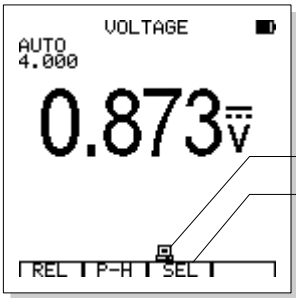
Before the communication between PC QM-1577 series scope meter, PC QM-1577 software should installed on PC and the interface cable should plug in both PC and scope meter properly. About the PC software's installment and the use, as well as interface cable's connection method please refer to the related chapter.

The puss button COM/SETUP on scope meter controls the communication function. Presses this button to start communication and the icon  will present in LCD to indicate that communication already started. Presses this button again, communication will stop and icon  will disappear.


Communication in DMM mode

Communication in DMM mode can upload current results of the measurement of

1. Press the key of COM/SETUP to start the communication between meter and PC. Press that key again the communication will be stop and the icon disappear.
2. After the starting of communication, the digits and their units on LCD will similarly but lags a while for the upload. Those digits can be recorded, saved
3. In the course of communication, PC QM-1577 will never stop renew the digits relative mode, the PC QM-1577 also displays relative volume. And the P-H,



PC Communication
Menu



meter to PC.
PC and the icon of  will be displayed on meter's LCD screen.

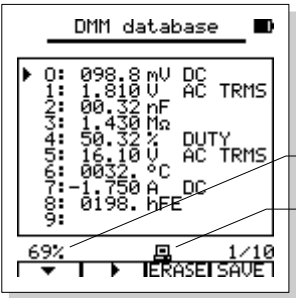
display on the DMM digits window of PC QM-1577 completely and printed.
even the meter in data HOLD status. If the meter displays digits in conductivity, dB etc. will not be displayed on PC QM-1577

NOTE	Communication function has no time limit. But when communication, because the RS232/USB cable occupied AC adaptor jack, meter cannot use the external power supply, the communication time is limited by the battery capacity.
NOTE	About other operations of scope meter please refer to the User's Manual of PC QM-1577 series.

Communication in DMM database

With communication function in DMM database, user can upload all data to PC

1. Press the key of COM/SETUP in database mode to start the communication
2. When data transport start, the LCD will display the icon of communication  needs ten seconds.
3. Once the progress retches 100%, upload done and icon  disappear.
4. Press the key of COM/SETUP again will initiate data upload once more.



Rate of progress
PC Communication

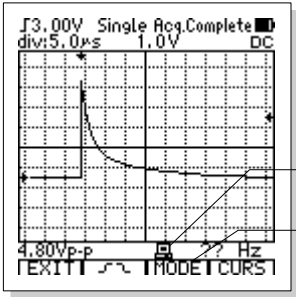
completely. The method is as follows:
between the meter and PC and upload the information of database.
and progress of upload. The complete upload process probably

NOTE	Before upload start, user might clear the DMM data record window of PC QM-1577 to get a 'clear' list of the meter's database.
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Communication in DSO mode


With communication function in DSO mode, user can upload all waveform to PC.

1. Press the key of COM/SETUP to start the communication between meter and PC. Press that key again the communication will be stop and the icon disappear.
2. After the starting of communication, the waveform displayed on LCD will similarly but lags a while for the upload. Those waveforms can be saved and
3. Since a waveform upload need several seconds the rate of renew both the difficulty of the operation of the button on the meter. If the user wants to adjust the meter in communication, press the key COM/SETUP to stop communication first.
4. After freeze of the waveform and a single acquire complete, waveform upload will stop. In this time, whether communication started or not, press COM/SETUP key, the frozen waveform can be sent to PC. Press the key of COM/SETUP again will initiate data upload once more.



PC Communication



Menu

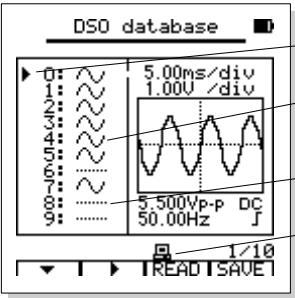
The method is as follows:
 PC and the icon of  will be displayed on meter's LCD screen.
 display on the DSO waveform window of PC QM-1577 completely printed.
 meter and PC QM-1577 is limited. Lower renew rate will cause the

NOTE	When the meter is in slow scan status, as the scan need quite long time, the renew rate of the waveform in PC QM-1577 will also be prolonged.
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Communication in DSO database

Communication in DSO database function can upload the data in database to

1. Select the data record that you want to upload. If in preview mode, press can into waveform read function.
2. Press COM/SETUP button, the meter will send the selected data to PC.
3. If the mark of selection points to or READ an empty record, no data will
4. When upload the icon of communication  will be displayed on the LCD. the icon  will disappear. Press button COM/SETUP again will initiate



Mark of selection

Waveform record

Empty record

PC Communication

PC. The procedure is as follow:
 button F1 and F2 to let the selection mark point the record. Or user
 upload.
 The upload process takes about for 5 seconds. When upload done,
 data upload once more.

MAINTENANCE

Keep the interface cable dry.

If it gets wet, wipe it off.

Keep the cable clean.

Clean the Meter with a damp cloth and a mild soap. Do not use abrasives, solvents, or alcohol.

Handle the instrument gently and carefully.

Dropping the interface cable may damage the electronic parts or the case.

Do not fold the cable excessively

Excessively fold may cause the cable interior broken or the bad contact.

Use and store the instrument in normal temperature.

Temperature extremes can shorten the life of the electronic parts and distort or melt plastic parts.

TROUBLESHOOTING

If you experience a problem when you upload data to PC, try the corrective actions below before concluding that the cable needs repair.

PC can't get any data

1. Communication cable not installed or not connected properly.
2. USB driver not installed before using a USB interface cable.
3. The operation mode selection is difference between PC QM-1577 program and the meter.
4. Communication port is not active or not selected correctly.
5. After inset USB plug into PC, Window system will check, identify, and assign resource to the interface. This process requires certain time. So, USB cable should plug into PC before run PC QM-1577 program, and then Activate communication port, Otherwise communication can not establish.
6. Whether the cable plug has been drawn out/inserted again? If so, let the PC QM-1577 A program search the communication port again.
7. PC QM-1577 program in communication pause status。

Data error

1. Check the cable not broken and plugged properly.
2. In communication, any change of operation mode of instrument as well as PC QM-1577 program may cause the data error.