INSTRUCTION MANUAL

RP Monitor

for Windows

K9461 7th edition

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(K9641IM030602)

Version information

This manual is intended for use with the RP Monitor software versions 2, 3 and 4. Please make sure that you have the correct version.

This manual (7th edition) is written for RP Monitor versions 2.G0, 3.G0, 4.G0 and later.

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Instruction Manual Version History

Edition	Software version	Date	Contents
1	1.00-1.23	03/07/1995	First edition RS-232C mode only
2	2.00	21/01/1996	KM memory receive mode added
3	2.50-2.93 3.00-3.43	30/04/1996	Read only mode added Multi-point measurement mode (R) added Multi-point measurement mode (M) added Map display added Alarm list display added
4		29/05/1996	Wrong values of 3rd edition corrected
5	2.A0-2.E5 3.A0-3.E5 4.A0-4.E5	08/10/1998	Toolbar, status bar, tool tips added (major user interface change) KM memory multi mode added Read-only multi-point added KX-28A tube multi-point mode added Tube multi-point mode (M) added Multi-point measurement mode (R) plus added (temperature/humidity compliant) Processing value file creation Movement of files more than 180 days old Measurement data output added Single/total added
6	2.F0- 3.F0- 4.F0-	06/02/2000	Number of display channels increased from 6 to 8 for compatibility with KR-12A KR-12A memory receive mode added Program file name changed Old name: K9461.EXE New name: RP_MON.EXE Bellows sampler compatibility (cycle purge possible) Multi-point measurement mode (R) broadcast command adopted Measurement data output changed (8-channel compatibility) Paper size changed from B5 to A4

Instruction Manual Version History

Edition	Software version	Date	Contents
7	2.G0- 3.G0- 4.G0-	02/06/2003	Automatic list/graph print added Operation history record option added Particle counter communication history record option added Alarm sound changed to dedicated WAV file Measurement data output changed again to accommodate KF-02B (10-channel compatibility) Map zoom capability added Comment field with print capability added to graph and list

1. Outline

This software is designed to run under Windows 3.1/95/98. It allows automatic operation control of process particle counters and particle counters for airborne or liquid-borne particles. The software provides for data collection, display, filing, and printing of measurement data. Measurement modes for various types of measurement can be selected.

2. Hardware Requirements

(1) Computer

- IBM PC/AT or compatible computer capable of running the Microsoft Windows 3.1/95/98. For multi-point measurements, a Pentium CPU is recommended.
- Free hard disk space must be at least 4 megabytes. In addition, sufficient free space to store measurement data should be available.
- 3.5 inch floppy disk drive
- RS-232C interface supported by Windows, for connection to particle counter

(2) Windows

- Microsoft Windows 3.1/95/98 or later (the software will also run under Windows 95)
- This software is a 16-bit application developed under Windows 3.1.
- Printer supported by Windows, with dedicated printer driver

(3) RS-232C interface expansion board

- Required if the number of internal serial ports in the computer is not sufficient.
- Expansion board must be supported by Windows, supplied with dedicated driver, and capable of being used as standard device. If a serial port is recognized by the Windows Terminal applet (under Accessories), it can be used.

(4) UPS (Uninterruptible Power Supply)

- To prevent the possibility of data loss (or fatal hard disk damage) in the event of a power failure, be sure to equip the system with a UPS (Uninterruptible Power Supply) designed for personal computers.

3. RP Monitor Setup Procedure

(1) First set up Windows as follows. For details on Windows setup, please refer to the Windows documentation.

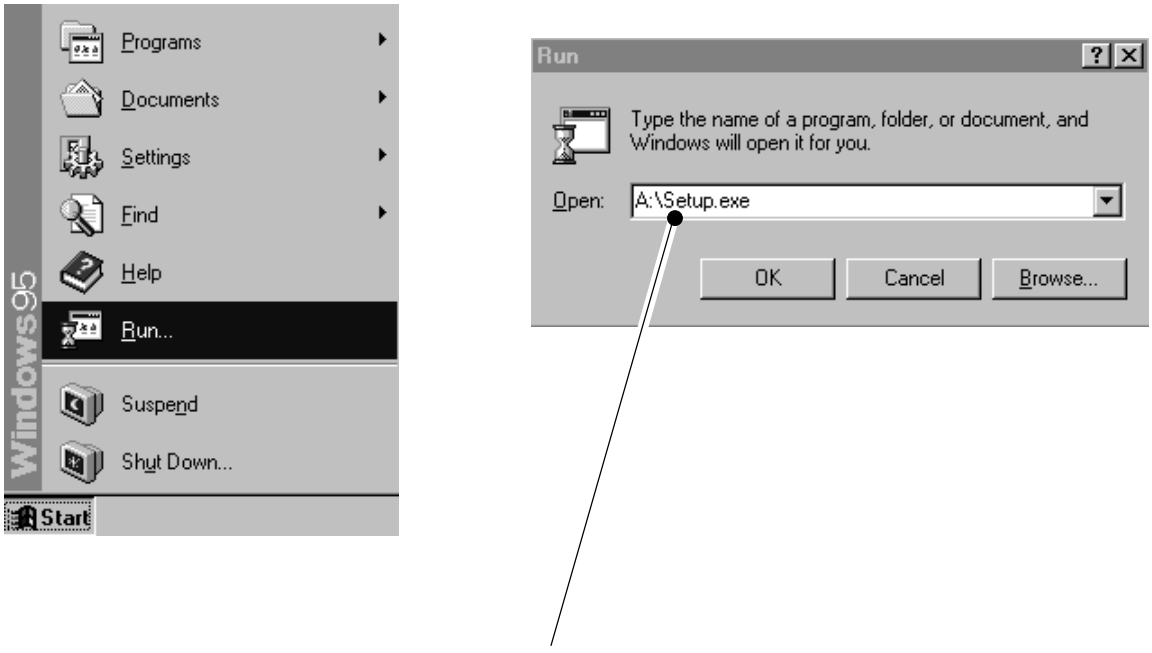
While measurement with RP Monitor is being carried out, no other processes that may cause a slowdown in the processing speed of the computer should be running. Otherwise there is a possibility of errors when communicating with particle counters, or partial loss of measurement data.

- Do not use any screen savers.
- Turn off energy saving or suspend mode.
- Turn off hard disk shutdown.
- Turn off any automatic maintenance tools (such as Scandisk etc.).

(2) Shut down all other applications before running Setup. Otherwise the program may not be installed correctly.

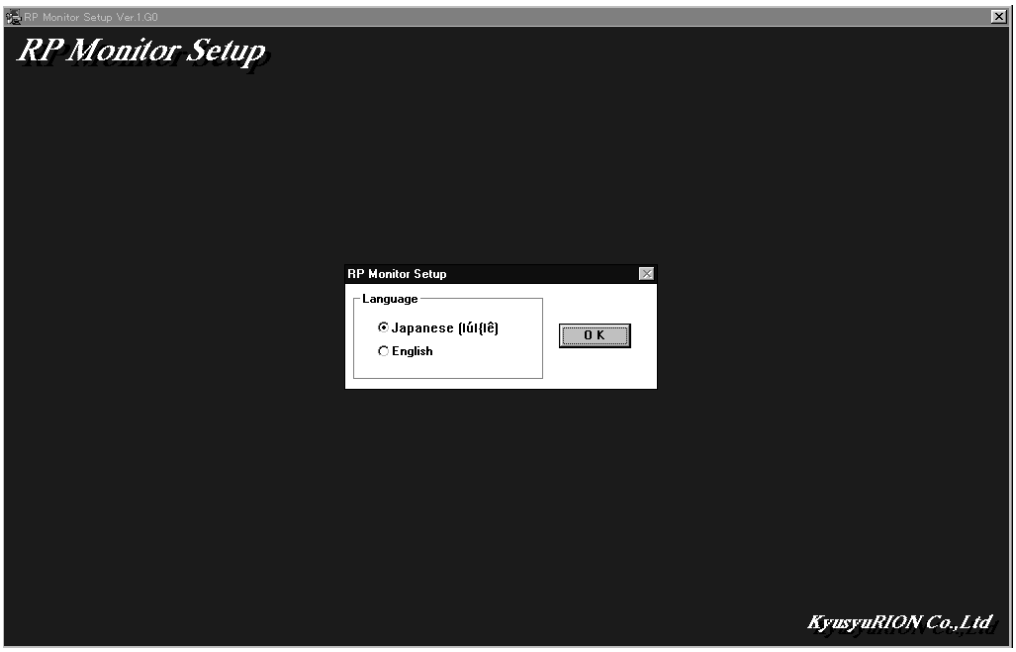
(3) Insert the RP Monitor disk into the floppy disk drive. This is assumed to be drive A: in the following explanation.

(4) Select "Run" to run the program SETUP.EXE contained on the floppy disk.

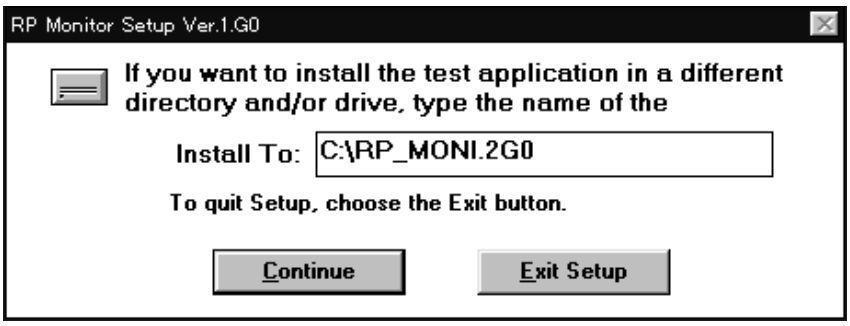


(5) Enter "A:\Setup.exe" on the command line, and press the Enter key.

(6) The RP Monitor setup program will execute.



(7) The program asks which language should be used. Select Japanese or English. The language chosen here will be used not only for the installation routine but also for the RP Monitor program after setup is completed. The language can be changed later. If the operating system is Japanese Windows, some messages may not be in English even if English is chosen as the language for RP Monitor.



(8) Enter the location where RP Monitor is to be installed. To accept the displayed location, click on the [Continue] button. The suggested folder name uses the software version, so that different versions can be installed in different folders, and existing versions will not be overwritten.

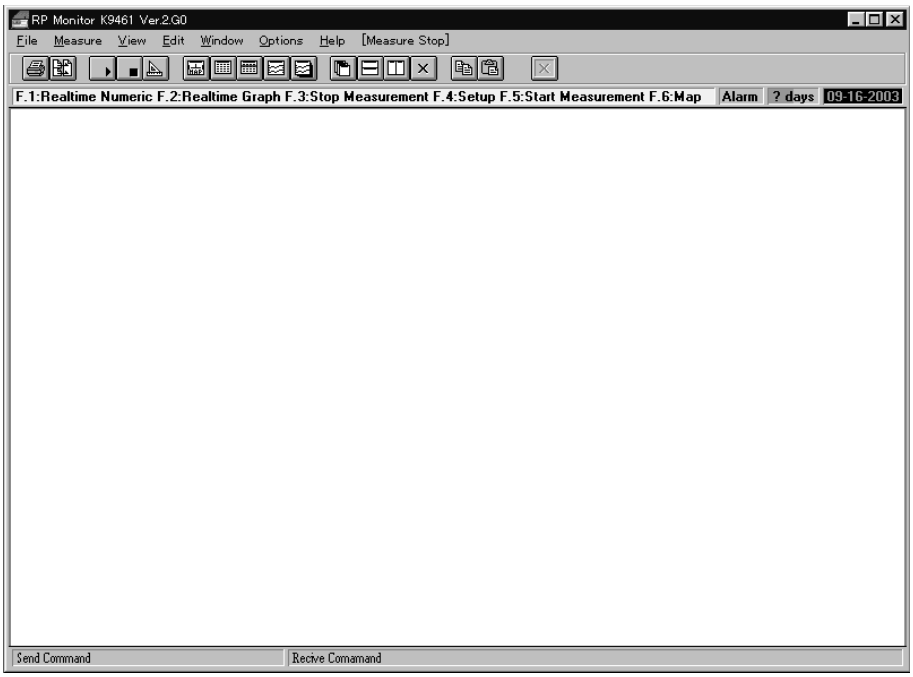
(9) A folder called \DATA will be automatically created under the folder chosen as installation target. A Measurement data sample file called SAMPLE.TXT as well as other files will be copied to this folder.

(10) When installation was completed successfully, a program group called RION Application will have been created in the program menu.

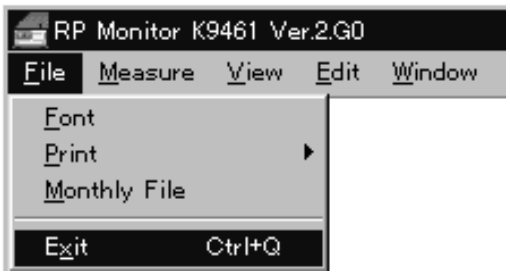
4. Program Startup and Termination

(1) To start RP Monitor, click on the [START] button and select [Programs], [RION Application], and then [RP Monitor Ver xxx]. "xxx" stands for the version number.

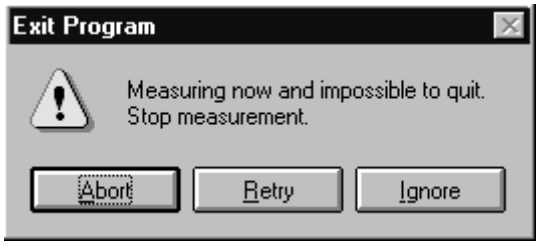
(2) Immediately after startup, the RP Monitor display looks as follows.



(3) To shut down RP Monitor, select [File] from the menu bar and then select [Exit].



(4) If a measurement is in progress, the following message is displayed. Terminate the measurement and then shut down the program.

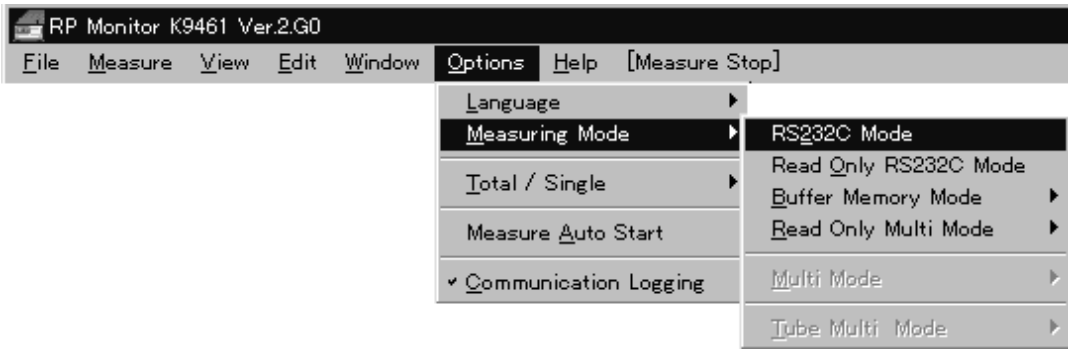


Note:

While RP Monitor is running and a measurement is being performed, you should avoid running other applications on the same computer. Windows is not a multi-tasking operating system. If another application carries out a lengthy processing sequence, operation of RP Monitor may be interrupted, causing communication errors or other problems. Screen savers and other resident-type applications should also not be used.

5. Selecting the Measurement Mode

RP Monitor comprises a large number of measurement modes. To switch between measurement modes, select [Options] from the menu bar and then select [Measuring Mode]. When the measurement mode is changed, the program will shut down automatically. Restart the program to use the new mode.
It is not possible to carry out measurement in different modes simultaneously.



Ver 2

The following modes (A to G) can be selected.

A : RS-232C mode
B : Read-only RS-232C mode
C : KR-12A memory receive mode
D : KM memory receive mode
E : Read-only multi (R) from bus line
F : Read-only (R) plus 330 from bus line
G : Read-only from data file mode (LAN)

Ver 3

The following modes (H to L) can also be selected.

H : Multi mode (R)
I : Multi mode (M)
J : KM memory receive multi mode
K : KX-28A tube multi-point mode
L : Manifold multi-point mode (M)

Ver 4

Only the following mode can be selected.

M : Multi mode (R) plus 330 mode

Note:

The date and time information maintained by RP Monitor is based on the clock in the computer. Make sure that the "Date and Time Properties" settings are correct.

Note:

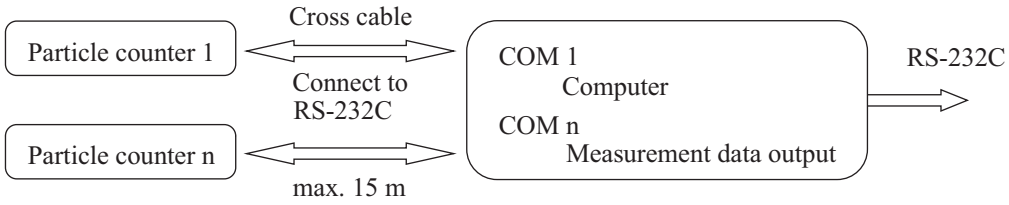
When using Windows 2000, adjust the internal clock of the computer only while RP Monitor is not running.

6. Measurement Methods

6.1 Measurement Method A: RS-232C Mode

(1) Particle counter connection and setup

[1] Connect the particle counters to the COM ports, as shown below.



[2] When using an RS-232C interface expansion board or USB serial adapter, refer to the documentation of the board before starting RP Monitor. Make sure that all switches of the board are set correctly, and that the Windows driver supplied by the manufacturer of the board is installed correctly. If the board has not been set up correctly, the additional COM ports will not be shown in the setup window of the RP Monitor.

[3] Particle counter setup

The RS-232C interface settings of the particle counter should be left in the factory default condition.

- Particle counter other than KM-07

Data transfer rate:	4800 bps
Parity:	even
Number of stop bits:	2
Number of data bits:	7
Terminator:	*<CR><LF>*

- Particle counter KM-07, KM-48 or similar

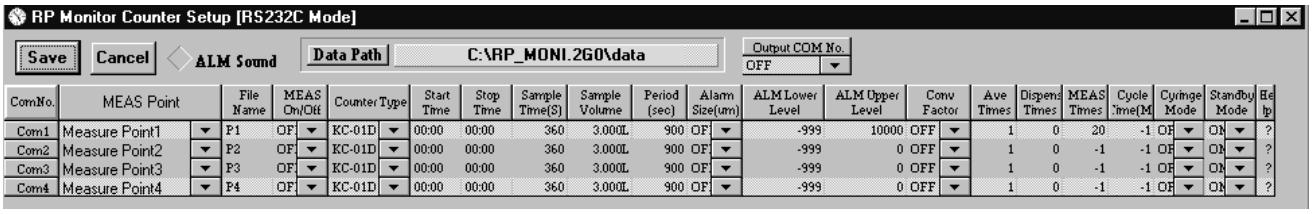
Data transfer rate:	9600 bps
Parity:	none
Number of stop bits:	1
Number of data bits:	8
RS-232C:	Normal

(2) Measurement parameter settings

[Measure] → [Setup] or F4

Toolbar 

Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method A.



(3) Measurement start

[Measure] → [Start] or F5

Toolbar 

Sets the particle counters to the measurement condition and starts measurement.

Note:

- Before starting measurement with the RP Monitor software, the particle counters must be in the stop condition. If a particle counter is already performing measurement, errors may occur.
- When measurement is started, the particle counters are set to the remote condition, making the controls on the operation panel inactive. Items that are not controlled by the RP Monitor software, such as the particle counter display size selection, should be set before starting measurement.
- The alarm function of the particle counter operates independently of the RP Monitor alarm function.
- If an unrecoverable error (disk full error, etc.) occurs during measurement, the measurement is stopped.

(4) Measurement end

[Measure] → [Stop] or F3

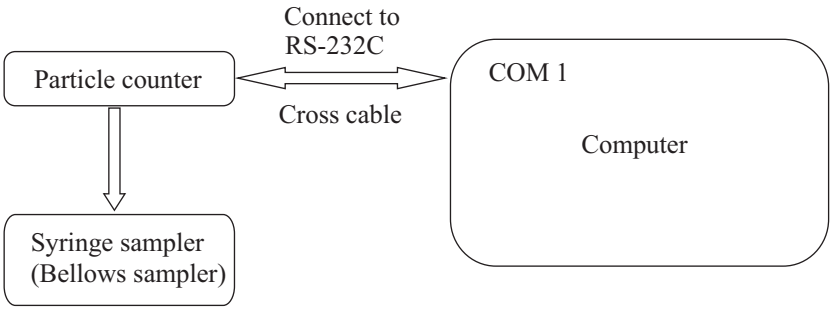
Toolbar 

After confirmation, measurement with the particle counters is stopped. The processed measurement values (Min. Ave. Max. Times) are written to the measurement data file.

(5) Measurement with syringe sampler or bellows sampler in RS-232C mode

Starting from this version, the blank volume (blank suction volume) can be set at the syringe sampler.

Connection example



Example

2 blank measurements of 10 mL/min are performed with the particle counter, followed by 5 measurements in 10 mL units

[1] Make KZ-30W settings as follows

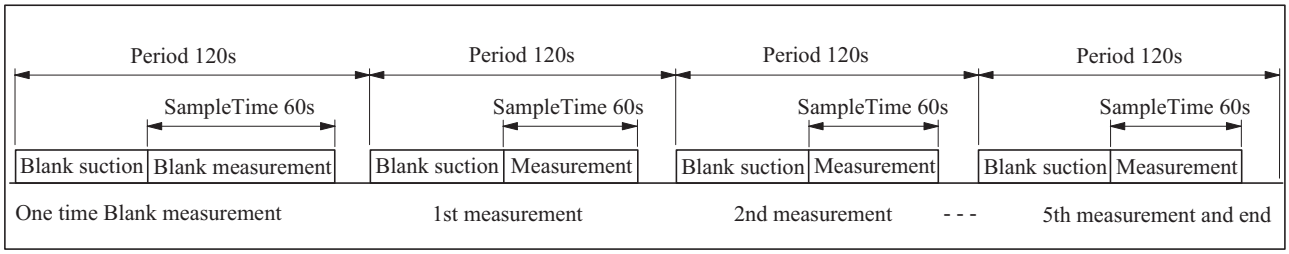
Sample flow rate = 10 mL/min
Drain flow rate = 50 mL/min
Measurement volume = 10.00 mL (set at syringe sampler)
Blank volume = 1.00 mL (set at syringe sampler)
Measurement repeat count = 1

[2] Time to perform 1 10 mL measurement is calculated

Draw time: (Blank:1 mL+Measurement:10 mL)÷10 mL×60 s = 66 s
Drain time: 10 mL ÷ 50 mL × 60 s = 12 s

[3] Set up RP Monitor as follows.

Sample Time = 60 s (measurement time; match to syringe sampler)
Period = 66 s (draw time) + 12 s (drain time) + 4 s (fixed value)
= 82 s or more (example: Period = 120)
Dispense Time = 1 (example: 1 blank measurements)
MEAS Times = 5 (example: measurement count 5)
Syringe Mode = ON (Do not send stop command)
Standby Mode = OFF (start measurement immediately)



[4] Measurement example with above settings

Date	Time	0.2um	0.3um	0.5um	1um	2um	Alarm Error
95-07-01	00:00:00	7259	363	26	6	0	N
95-07-01	00:02:00	7256	332	15	2	0	N
95-07-01	00:04:00	7255	353	18	5	0	N
95-07-01	00:06:00	7314	380	22	3	0	N
95-07-01	00:08:00	7190	337	12	4	0	N
Max	00:06:00	7314	380	26	6	1	M.Times=
Ave	—:—:—	7255	353	19	4	0	5
Min	00:08:00	7190	332	12	2	0	

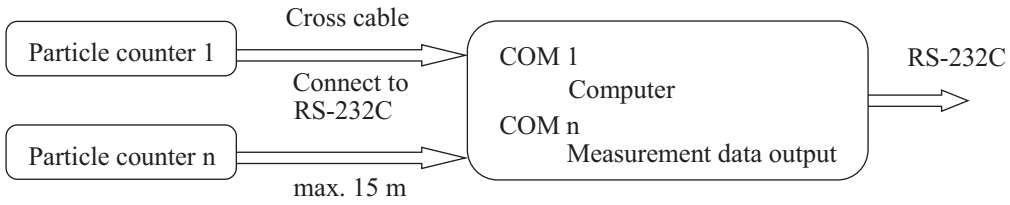
Note:

This software application does not control operation of the syringe sampler itself. For example, if measurement at RP Monitor is stopped while drawing sample fluid, the syringe sampler will continue with the same setting until the preset amount is drawn, and then the unit will stop.

6.2 Measurement Method B: Read-Only RS-232C Mode

(1) Particle counter connection and setup

[1] Connect the particle counters to the COM ports, as shown below.



[2] When using an RS-232C interface expansion board or USB serial adapter, refer to the documentation of the board before starting RP Monitor. Make sure that all switches of the board are set correctly, and that the RS-232C Windows driver supplied by the manufacturer of the board is installed correctly. If the board has not been set up correctly, the additional COM ports will not be shown in the setup window of the RP Monitor.

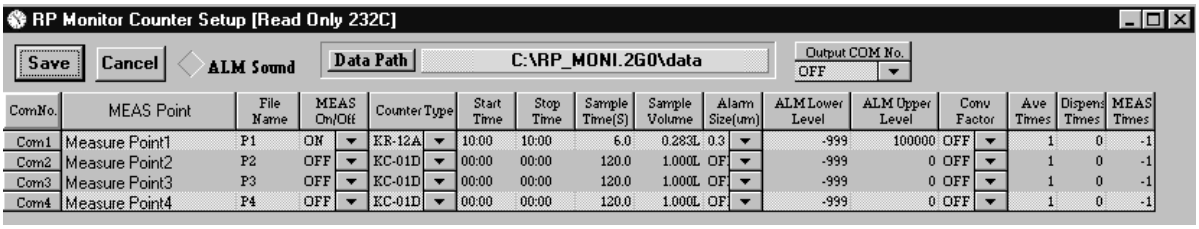
[3] Particle counter setup
The RS-232C interface settings of the particle counter should be left in the factory default condition.

Data transfer rate:	4800 bps
Parity:	even
Number of stop bits:	2
Number of data bits:	7
Terminator:	<CR><LF>

(2) Measurement parameter setting example

[Measure] → [Setup] or F4

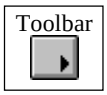
Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method B.



ComNo.	MEAS Point	File Name	MEAS On/Off	Counter Type	Start Time	Stop Time	Sample Time(S)	Sample Volume	Alarm Size(um)	ALM Lower Level	ALM Upper Level	Conv Factor	Ave Times	Dispens Times	MEAS Times
Com1	Measure Point1	P1	ON	KR-12A	10:00	10:00	6.0	0.283L	0.3	-999	100000	OFF	1	0	-1
Com2	Measure Point2	P2	OFF	KC-01D	00:00	00:00	120.0	1.000L	OF	-999	0	OFF	1	0	-1
Com3	Measure Point3	P3	OFF	KC-01D	00:00	00:00	120.0	1.000L	OF	-999	0	OFF	1	0	-1
Com4	Measure Point4	P4	OFF	KC-01D	00:00	00:00	120.0	1.000L	OF	-999	0	OFF	1	0	-1

(3) Measurement start

[Measure] → [Start] **or** **F5**



Starts measurement with the particle counters.

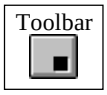
The sequence [Measure] → [Start] sets RP Monitor to the receive condition, and measurement starts by pressing the Start button of the particle counter.

Note:

- In this mode, the particle counters are not controlled by the RP Monitor software. The measurement is determined not by the RP Monitor setting but by the setting at the particle counter.
- If an unrecoverable error (disk full error, etc.) occurs during measurement, the measurement (receive measurement data) is stopped.

(4) Measurement end

[Measure] → [Stop] **or** **F3**



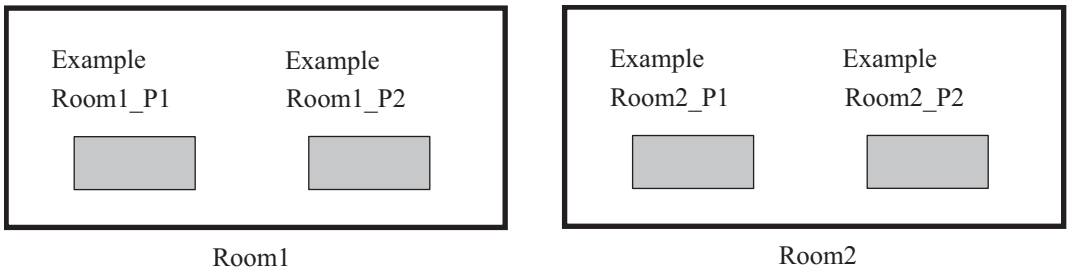
After confirmation, measurement with the particle counters is stopped. The processed measurement values (Min. Ave. Max. Times) are written to the measurement data file.

6.3 Measurement Method C: KR-12A Memory Receive Mode

With this mode, a particle counter with a buffer memory (such as the KR-12A) can be used for measurements in the field, storing measurement data temporarily in the buffer. After measurement are completed, the particle counter is connected to the computer and measurement data are transferred to the computer.

(1) Preparations

[1] Determine the measurement points by assigning them Label names. The label name can be up to 10 alphanumeric characters long. Special characters or kanji (Japanese characters) are not allowed.



[2] Select the sample volume (0.01CF, 0.1CF, 1CF, 1.0L, 10L) for each measurement point.

Example

Room1_P1	Sample Volume = 0.1 CF
Room1_P2	Sample Volume = 0.1 CF
Room2_P1	Sample Volume = 0.1 CF
Room2_P2	Sample Volume = 0.1 CF

[3] Set the Alarm Size, Alarm Level, and Conversion Factor parameters.

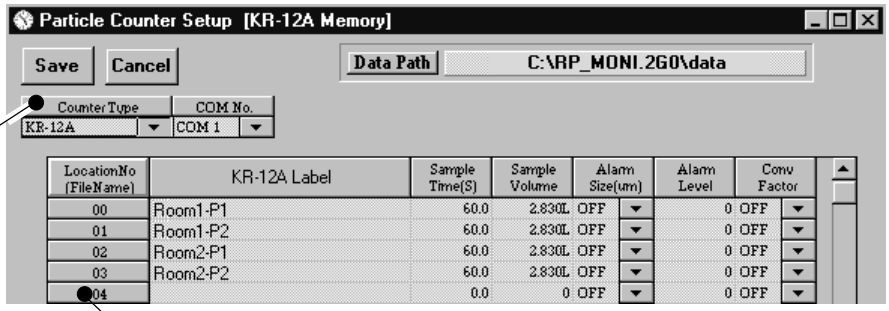
(2) Measurement parameter setting

Toolbar

[Measure] → [Setup] or F4

- Select the type of particle counter from the Counter Type list.
- Select the number of the COM port (COM No.) to which the particle counter will be connected on the computer.
- Enter the drive and folder name (Data Path) for storing the measurement data file.
- Enter the contents of steps [1] to [3] above into the particle counter setup.
  Using the following keyboard shortcuts makes the entry process easier (Copy = [Ctrl] + [C], Cut = [Ctrl] + [X], Paste = [Ctrl] + [V]).

Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method C.



First select the Counter Type.

This becomes the location number and is used in the file name (00 to 99).

(3) KR-12A setup

Carry unit to measurement points and carry out measurement.

Counter (buffer memory)

(1) Make the following settings for the KR-12A.
- Adjust date and time so that they are current. (Clock Setup Menu)
- Clear all buffer data. (Buffer Count)
- CNT Data can be either Cumulative or Differential.
  (The value sent to RP Monitor is Cumulative. To display the Differential value at RP Monitor, set RP Monitor to Single.)

(2) Input the selected label name at the KR-12A. For information on input procedure, please refer to the KR-12A documentation. Note that you should use HHPC6Utility.exe supplied with the KR-12A to set the I/O port of the KR-12A to Serial 9600 .

(4) Mobile measurement

Perform measurement in the field as follows.

[1] Set the KR-12A measurement mode to Concentration mode, Totalize mode, or Audio mode. In any mode, the value sent to the RP monitor is the same as in Totalize mode (actual data).

[2] Enter the predetermined Label name and Sampling Volume into the KR-12A. If the Sampling Volume settings are used for all measurement points, no change is required, but before measurement, the Label name must always be entered.

[3] Perform measurement at each point with the KR-12A.
When a measurement is completed, measurement data are stored automatically in the buffer memory of the KR-12A.

[4] Measurement can be repeated until the buffer memory of the KR-12A (500 data) becomes full.

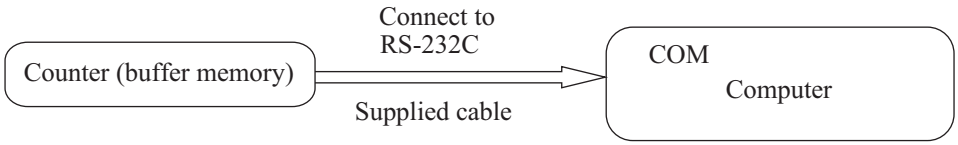
Other features:

- Sequence of measurement points can be freely changed.
  Because data are stored and managed using the Label names, data can be collected in any sequence.
- Measurement count can be freely changed.
  Even if the same measurement point is measured repeatedly, data will be managed properly using the date and time information.
- Measurement cycle can be freely changed.
  The measurement cycle can be changed, such as switching from daily to weekly checks.
- Multiple KR-12A units can be managed.
  Because the label name is used to manage measurement points, simultaneous measurement with several KR-12A units is possible provided that there are no duplicate label names. When receiving data from the same measurement point, always select the KR-12A with the oldest data first.

(5) Measurement data receive/store

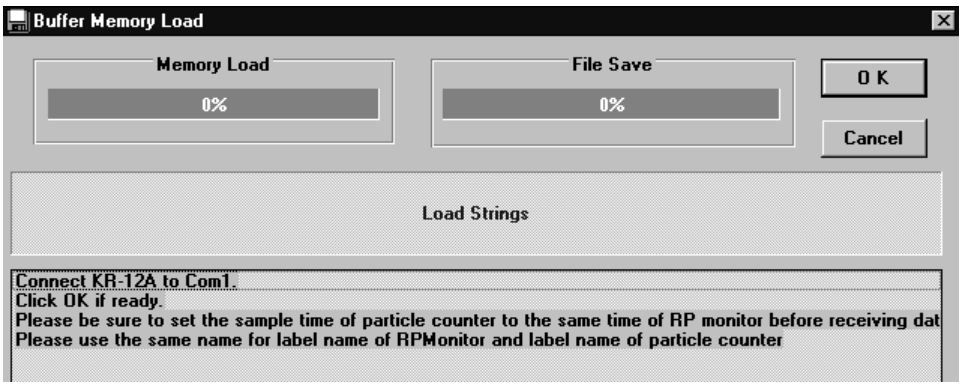
Connect the KR-12A to the computer as shown below.

- Set KR-12A I/O port to Serial Type2 (I/O Port).



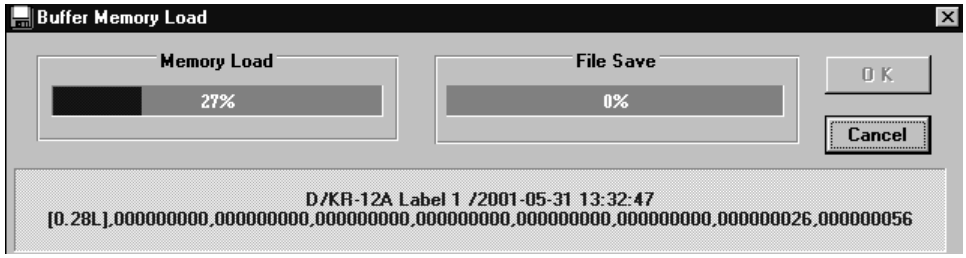
[1] From the menu, select [Measure] → [Start].

[2] When preparations for communication are complete, click on the [OK] button.



[3] When communication starts, the following display is shown, including the received string.

After all data have been received, they are automatically stored in a file. The file name is created automatically.



The file name convention is yy (year) mm (month) KRxx.txt.

Example: 0102KR00.txt

yy	:	Measurement year (2001)
mm	:	Measurement month (February)
KR	:	Fixed(always "KR")
xx	:	LOC number (LOC = 00)
txt	:	Text file extension

The TAB code is used as delimiter in the file.

For each LOC number (selected at SETUP window), one file per month is created.

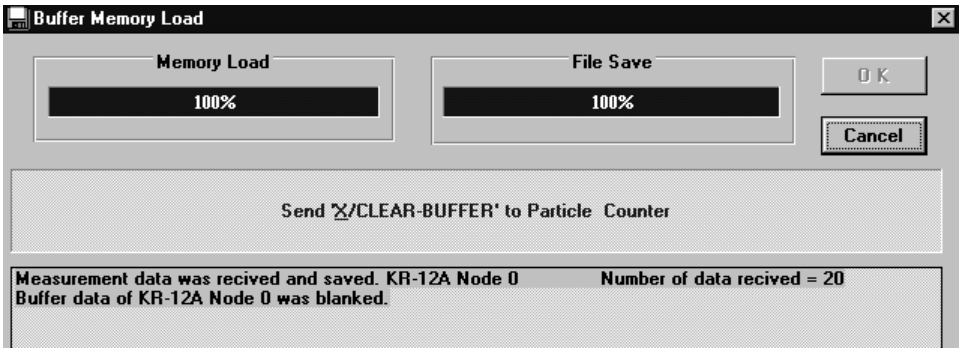
[4] If a communication error occurs, an error message is displayed. Check the KR-12A settings, the cable connection, and other possible causes.
When an error has occurred, correctly received data up to that point are stored in the file.

[5] After data have been sent from the KR-12A, they are automatically cleared from the buffer memory of the unit. Therefore it is not necessary to clear the data before the next measurement.

[6] The time required to receive and store 500 data sets from memory is about 4 minutes.

[7] If the Sample Volume setting of the KR-12A used for measurement was not appropriate, an error message will be shown when receiving these data. When you click on [OK], the data are not stored and the next data can be received. Clicking on [Cancel] will terminate the receive/store process.

[8] When the data receive process was completed successfully, the following display is shown.



Note:

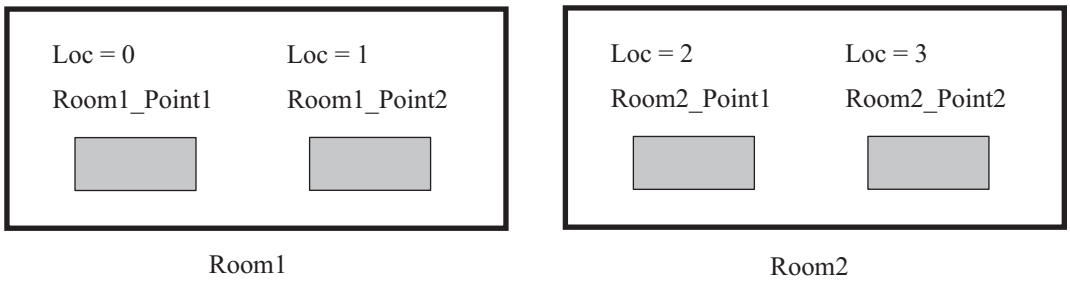
Because the data in the buffer memory of the KR-12A will be automatically cleared after having been transferred to the computer, they can no longer be sent directly to the printer (DPU-414) from the KR-12A. Reversely, when printing directly from the KR-12A to the printer, you must clear the buffer contents manually to enable data transfer to the computer.

6.4 Measurement Method D: KM Memory Receive Mode

With this mode, a particle counter with a buffer memory (such as the KM-07) can be used for measurements in the field, storing measurement data temporarily in the buffer. After measurements are completed, the particle counter is connected to the computer and measurement data are transferred to the computer. This is possible also with other particle counter models equipped with a buffer (KM-20, KM-27, etc.)

(1) Preparations

[1] Determine the measurement points by assigning them location ("LOC") numbers and names. The possible range for LOC numbers is 0 to 99. Enter the respective number at the KM-07 when making the measurement. LOC numbers must be unique; no duplication is allowed. Measurement point names may be up to 32 alphanumeric characters long (no special characters).



[2] Set the measurement time (Sample Time) for each measurement point.

Example

LOC = 0 Sample Time (Sec) = 60
LOC = 1 Sample Time (Sec) = 60
LOC = 2 Sample Time (Sec) = 60
LOC = 3 Sample Time (Sec) = 60

[3] Set the Alarm Size, Alarm Level, and Conversion Factor parameters.

[4] Set the particle size to measure with the KM-07.

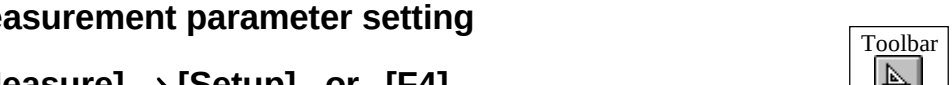
Example

CH1 = 0.3 um CH2 = 0.5 um

(2) Measurement parameter setting

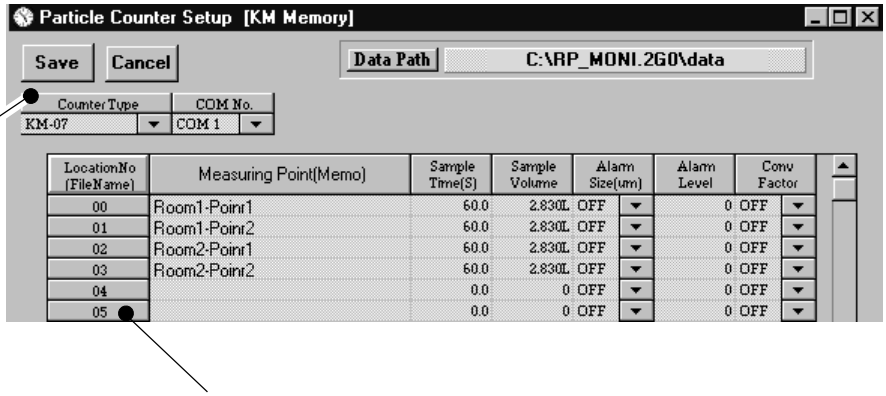
[Measure] → [Setup] or [F4]

Toolbar



- Select the type of particle counter from the Counter Type list.
- Select the number of the COM port (COM No.) to which the particle counter will be connected on the computer.
- Enter the drive and folder name (Data Path) for storing the measurement data file.
- Enter the contents of steps [1] to [3] above into the particle counter setup.
  Using the following keyboard shortcuts makes the entry process easier (Copy = [Ctrl] + [C], Cut = [Ctrl] + [X], Paste = [Ctrl] + [V]).
- Particle size data are stored for each measurement point at the time when measurement is carried out and data are received.

Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method D.



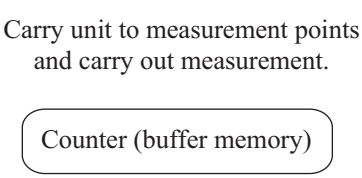
First select the Counter Type.

This becomes the location number and is used in the file name (00 to 99).

(3) KM-07 setup

Make the following settings for the KM-07.

- Adjust date and time so that they are current.
- Set interface mode to "Normal".
- Set data transfer rate to 9600 bps.
- Clear all buffer data.



(4) Mobile measurement

Perform measurement in the field as follows.

[1] Set the KM-07 measurement mode to Manual, Auto, or Average.
This can be changed also during measurement.

Manual: When measurement is started, only one measurement is carried out, using the preset measurement time.

Auto: When measurement is started, a preset number of measurements are carried out, using the preset measurement time. Instantaneous value data for all measurements are stored in the buffer.

Average: When measurement is started, a preset number of measurements are carried out, using the preset measurement time. Using the data from these measurements, the average value is calculated and stored in the buffer.

[2] Enter the predetermined LOC number, particle size, and sampling time into the KM-07. If the same particle size and sampling time settings are used for all measurement points, no change is required, but before measurement, the LOC number must always be entered.

[3] Perform measurement at each point with the KM-07.
When a measurement is completed, measurement data are stored automatically in the buffer memory of the KM-07.

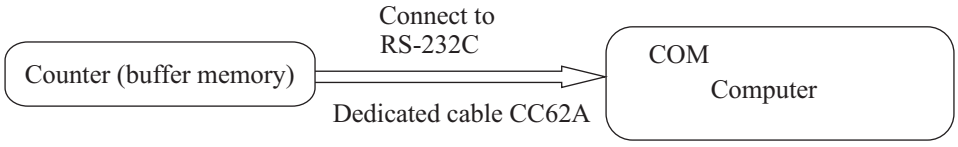
[4] Measurement can be repeated until the buffer memory of the KM-07 (200 data) becomes full.

Other features:

- Sequence of measurement points can be freely changed.
  Because data are stored and managed using the LOC number, data can be collected in any sequence.
- Measurement count can be freely changed.
  Even if the same measurement point is measured repeatedly, data will be managed properly using the date and time information.
- Measurement cycle can be freely changed.
  The measurement cycle can be changed, such as switching from daily to weekly checks.
- Multiple KM-07 units can be managed.
  Because measurement points are managed using the LOC numbers, several KM-07 units can be used simultaneously. However, if multiple data were collected for the same measurement point, be sure to load the older data into the computer first.

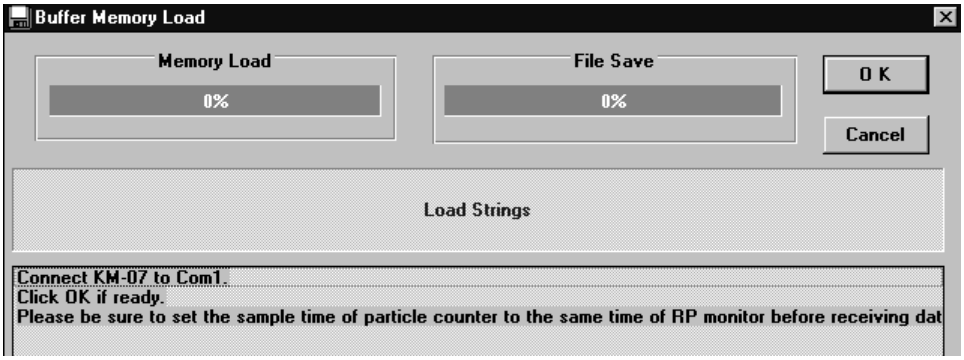
(5) Measurement data receive/store

Connect the KM-07 to the computer as shown below.

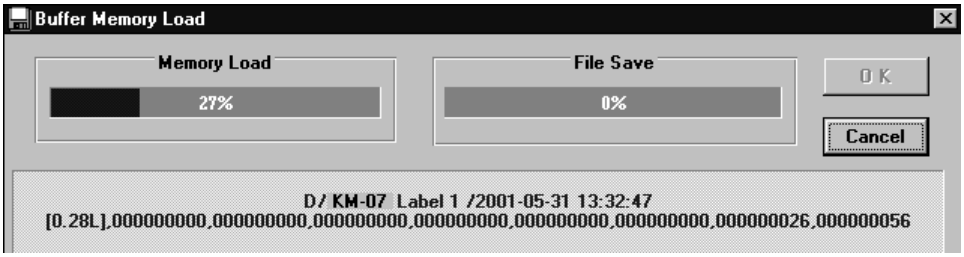


[1] From the menu, select [Measure] → [Start].

[2] When preparations for communication are complete, click on the [OK] button.



[3] When communication starts, the following display is shown, including the received string.
After all data have been received, they are automatically stored in a file. The file name is created automatically.



The file name convention is yy (year) mm (month) KMxx.txt.

Example:	0120KM00.txt	
yy:	Measurement year	(2001)
mm:	Measurement month	(February)
KM:	Fixed	(always KM)
xx:	LOC number	(LOC = 00)
txt:	Text file extension	

The TAB code is used as delimiter in the file.
For each LOC number, one file per month is created.

[4] If a communication error occurs, an error message is displayed. Check the KM-07 settings, the cable connection, and other possible causes.
When an error has occurred, only the correctly received data up to that point are stored in the file.

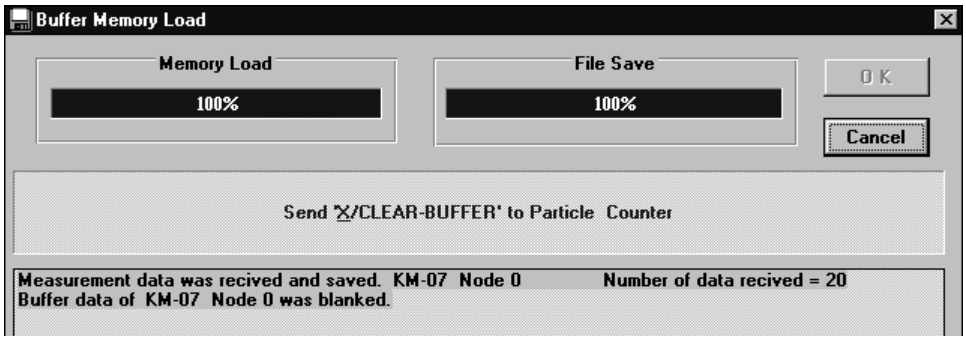
[5] After data have been sent from the KM-07, they are automatically cleared from the buffer memory of the unit. Therefore it is not necessary to clear the data before the next measurement.

[6] The time required to receive and store 200 data sets from memory is about 80 seconds.

[7] If the Sample Time setting of the KM-07 used for measurement was not appropriate, an error message will be shown when receiving these data. When you click on [OK], the data are not stored and the next data can be received. Clicking on [Cancel] will terminate the receive/store process.

[8] If the Particle Size setting of the KM-07 used for measurement was not appropriate, an error message will be shown when receiving these data. When you click on [Yes], the data will be stored in a file with a new name. Clicking on [No] will cause the data to be discarded.

[9] When the data receive process was completed successfully, the following display is shown.



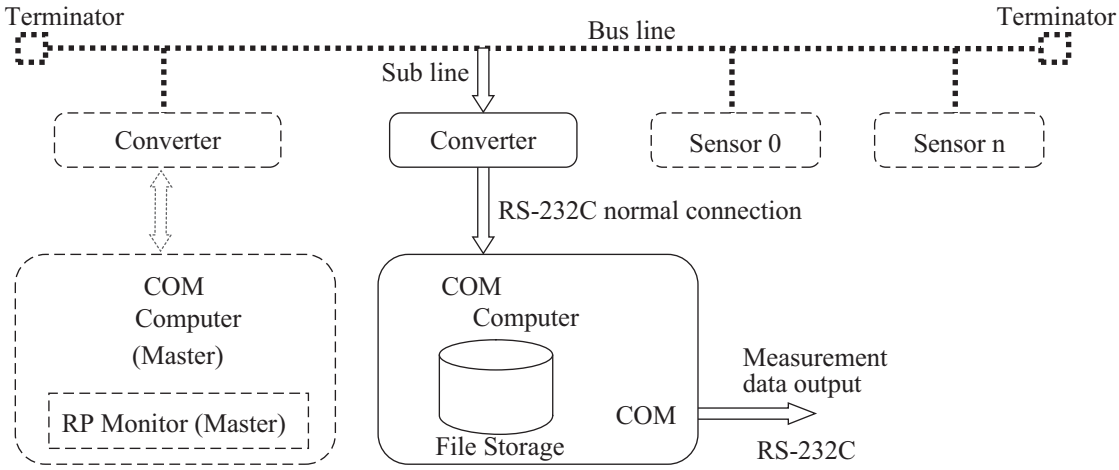
Note:

Because the data in the buffer memory of the KM-07 will be automatically cleared after having been transferred to the computer, they can no longer be sent directly to the printer (CP-10 or similar) from the KM-07. The same also applies if the data are sent to the printer first. They will be cleared from the buffer and therefore cannot be sent to the computer.

6.5 Measurement Method E: Read-Only Multi (R) From Bus Line

(1) Particle counter connection

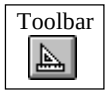
[1] Connect the existing bus line to the COM port of the computer, using the Converter II, as shown below. This mode can be used for particle count display at a remote location.



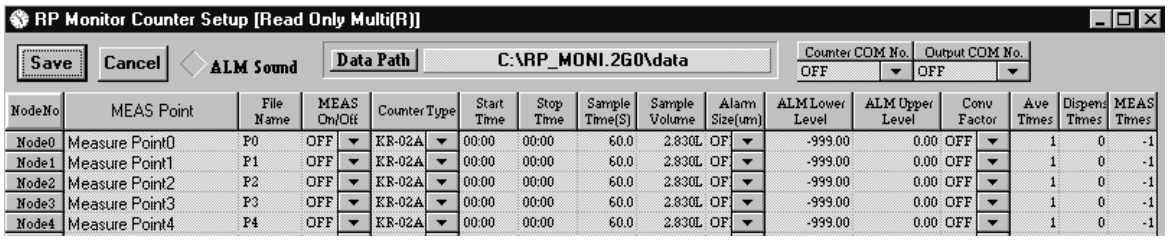
(2) Measurement parameter setting

[Measure] → [Setup] or F4

Toolbar



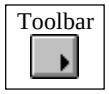
Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method E.



NodeNo	MEAS Point	File Name	MEAS On/Off	Counter Type	Start Time	Stop Time	Sample Time(S)	Sample Volume	Alarm Size(um)	ALM Lower Level	ALM Upper Level	Conv Factor	Ave Times	Dispens Times	MEAS Times
Node0	Measure Point0	P0	OFF	KR-02A	00:00	00:00	60.0	2.830L	OF	-999.00	0.00	OFF	1	0	-1
Node1	Measure Point1	P1	OFF	KR-02A	00:00	00:00	60.0	2.830L	OF	-999.00	0.00	OFF	1	0	-1
Node2	Measure Point2	P2	OFF	KR-02A	00:00	00:00	60.0	2.830L	OF	-999.00	0.00	OFF	1	0	-1
Node3	Measure Point3	P3	OFF	KR-02A	00:00	00:00	60.0	2.830L	OF	-999.00	0.00	OFF	1	0	-1
Node4	Measure Point4	P4	OFF	KR-02A	00:00	00:00	60.0	2.830L	OF	-999.00	0.00	OFF	1	0	-1

(3) Measurement start

[Measure] → [Start] or F5



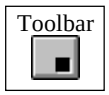
Starts the process for receiving measurement data from the particle counters.

Note:

- In this mode, measurement data can only be received if the master RP Monitor is currently carrying out measurement. Control of particle counters by RP Monitor and control of master RP Monitor is not possible.
- The measurement count may be different from the master RP Monitor. This is due to different handling of communication errors. (When a D=2 error or similar has occurred at the master, the slave discards these data as invalid.)
- The Command column of the real-time display shows only "Count n". Other commands such as "LDON" or "Stop" cannot be shown.
- When "Dispens Times", "Ave Times", "MEAS Times" etc. have been set, measurement must be started simultaneously with the master RP Monitor, otherwise results will be different.
- If an unrecoverable error (disk full error, etc.) occurs during measurement, measurement data receive is stopped.
- Measurement time information is sent at regular intervals from the master RP monitor for time matching at the slave computer, so that there will be no shift in measurement time.

(4) Measurement end

[Measure] → [Stop] or F3

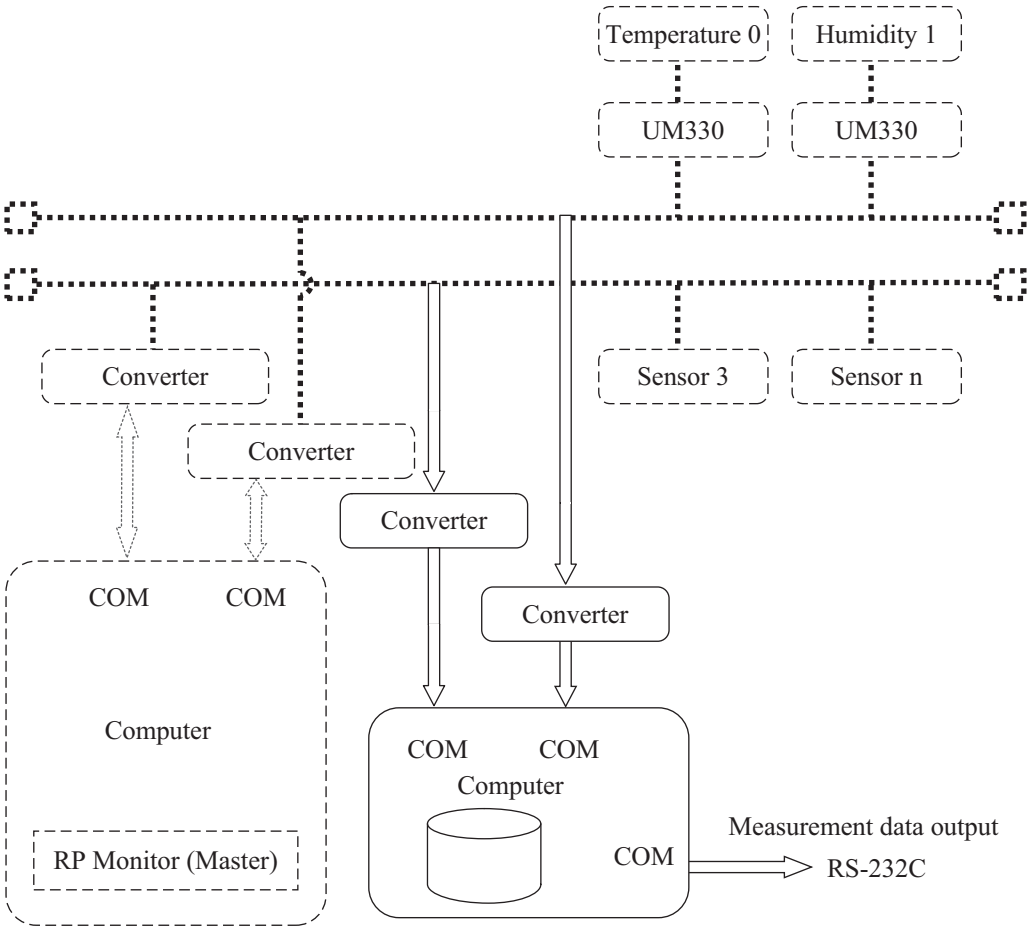


After confirmation, measurement data receive of RP Monitor stops. The processed measurement values (Min. Ave. Max. Times) are written to the measurement data file.

6.6 Measurement Method F: Read-Only Multi (R) Plus 330 From Bus Line

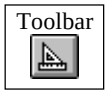
(1) Particle counter connection

[1] Connect the existing bus lines to the COM ports of the computer, using two Converter II units, as shown below.

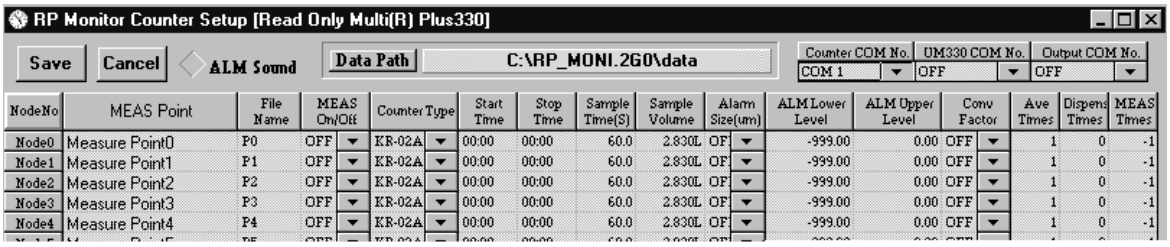


(2) Measurement parameter setting

[Measure] → [Setup] or F4

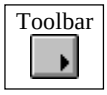


Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method F.



(3) Measurement start

[Measure] → [Start] **or** **F5**

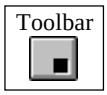


Starts the process for receiving measurement data from the particle counters.

- In this mode, measurement data can only be received if the master RP Monitor is currently carrying out measurement. Control of particle counters by RP Monitor and control of master RP Monitor is not possible.
- The measurement count may be different from the master RP Monitor. This is due to different handling of communication errors. (When a D=2 error or similar has occurred at the master, the slave discards these data as invalid.)
- The Command column of the real-time display shows only "Count n". Other commands such as "LDON" or "Stop" cannot be shown.
- When "Dispens Times", "Ave Times", "MEAS Times" etc. have been set, measurement must be started simultaneously with the master RP Monitor, otherwise results will be different.
- If an unrecoverable error (disk full error, etc.) occurs during measurement, measurement data receive is stopped.
- Measurement time information is sent at regular intervals from the master RP monitor for time matching at the slave computer, so that there will be no shift in measurement time.

(4) Measurement end

[Measure] → [Stop] **or** **F3**

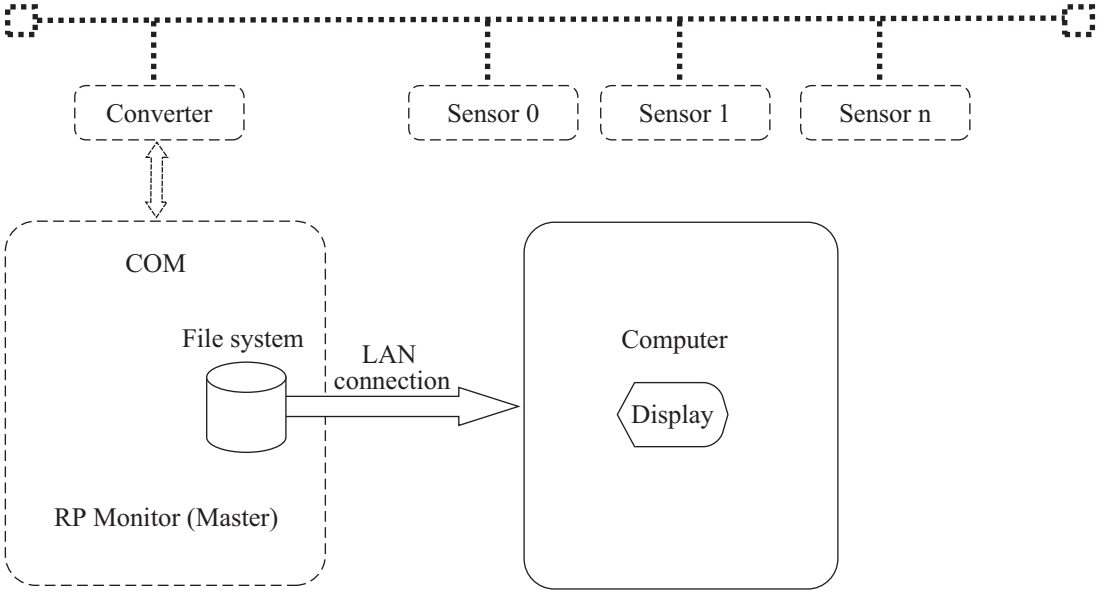


After confirmation, measurement data receive of RP Monitor stops. The processed measurement values (Min. Ave. Max. Times) are written to the measurement data file.

6.7 Measurement Method G: Read-Only From Data File Mode (LAN)

(1) Particle counter connection

[1] As shown below, data are received in this configuration not from particle counters but from the file system of an existing computer, shared via a LAN. This mode can be used for particle count display at a remote location.



(2) Select [Options] → [Measuring Mode] → [Read Only xxxxxx] → [From Data File (LAN)]

"xxxxxx" stands for one of the following modes:

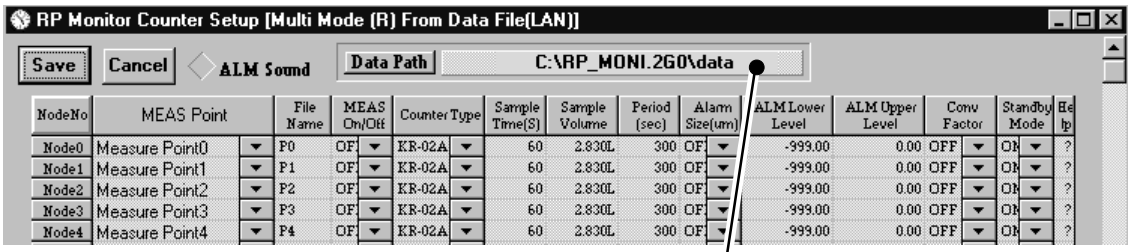
- Multi mode (R)
- Multi mode (R) plus 330 mode

(3) Measurement parameter setting

[Measure] → [Setup] or F4

Toolbar 

Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method G.



Allocate network drive and then specify network drive

(4) Measurement start

[Measure] → [Start] or F5

Toolbar 

Starts the process for receiving particle counter measurement data.

Note:

- The file system specified in the Data Path is monitored in intervals of 10 seconds. When measurement data were updated, the data are read in.
- In this mode, no measurement data file can be created (stored).
- Measurement data cannot be output via RS-232C port of computer.
- The Data Path for the particle counter should be set to the network drive. (Using the supplied Kfilecpy.exe program, it is also possible to regularly copy the file to another computer and specify the target folder for reading in measurement data.)
- Control of particle counters by RP Monitor and control of master RP Monitor is not possible.
- The Command column of the real-time display shows only "Row Count n", indicating the line in the measurement data file. This may be different from the count of the master RP Monitor.

(5) Measurement end

[Measure] → [Stop] or F3

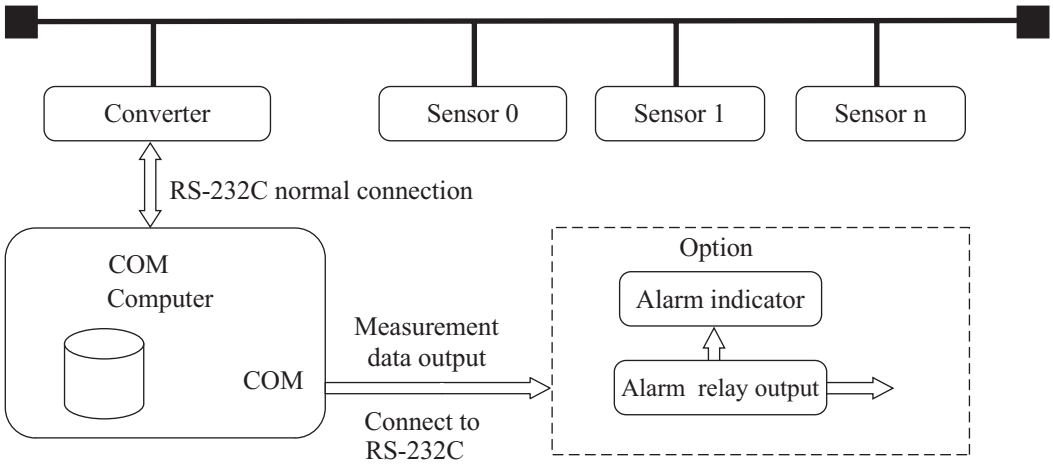
Toolbar 

After confirmation, measurement data receive of RP Monitor stops.

6.8 Measurement Method H: Multi Mode (R)

(1) Particle counter connection and setup

[1] As shown below, connect the particle counters to the COM port of the computer, via bus line, sub line, and converter.



[2] Particle counter setup

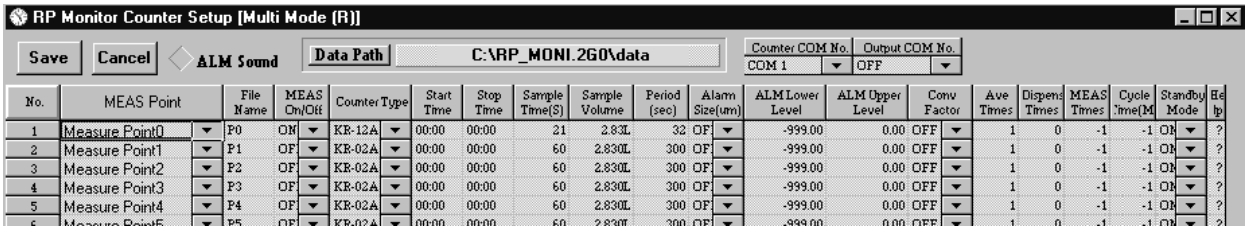
- Refer to the documentation of the particle counter to set the node address. (Any address between 0 and 19 can be chosen, but node addresses must be unique.)
- Set the network delay for applicable particle counters to 20 ms.
- Use the same communication parameters for all nodes. Standard setting is 4800 bps.

(2) Measurement parameter setting

Toolbar 

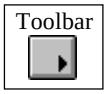
[Measure] → [Setup] or F4

Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method H.



(3) Measurement start

[Measure] → [Start] **or** **F5**



Sets the particle counter to the measurement condition and starts measurement.

Note:

- The alarm function of the particle counter is synchronized to the RP Monitor alarm function. When "Alarm = Y" is set at RP Monitor, the alarm relay contacts of the particle counter are shorted. When Alarm becomes "N", the relay contacts are released. In units with two sets of alarm contacts, the two sets operate identically.
- When the KZ-45A is used, certain limitations regarding the displayed information apply. For details, please refer to the documentation of the KZ-45A.
- If an unrecoverable error (disk full error, etc.) occurs during measurement, the measurement stops.

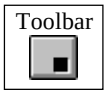
(4) Measurement restart

[Measure] → [Restart]

This restarts a particle counter whose power went off during a measurement. It does not affect other particle counters currently carrying out measurement.

(5) Measurement end

[Measure] → [Stop] **or** **F3**

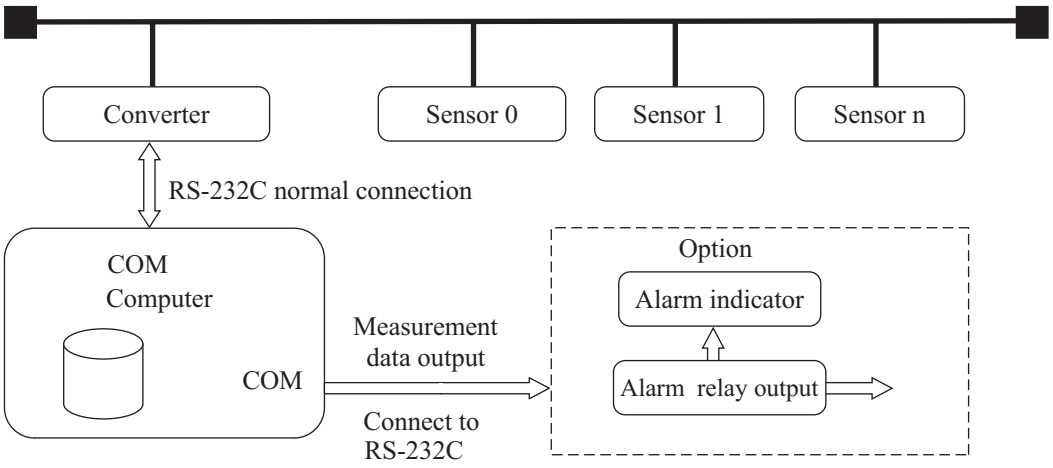


After confirmation, measurement stops. The processed measurement values (Min. Ave. Max. Times) are written to the measurement data file.

6.9 Measurement Method I: Multi Mode (M)

(1) Particle counter connection and setup

[1] As shown below, connect the particle counters to the COM port of the computer, via bus line, sub line, and converter.



[2] Particle counter setup

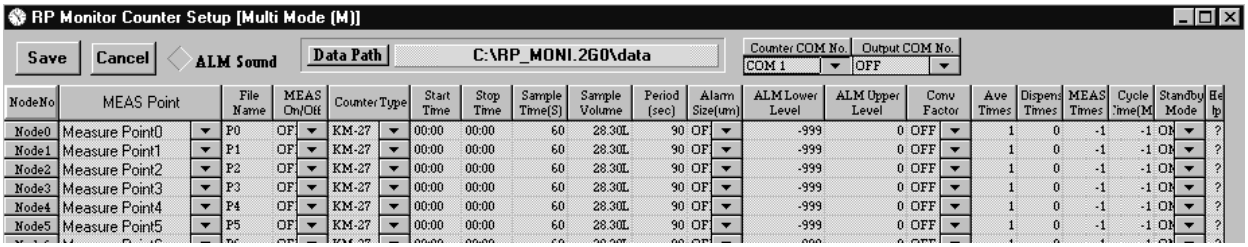
- Refer to the documentation of the particle counter to set the node address (LOC number).
  (Any address between 0 and 19 can be chosen, but node addresses must be unique.)
- Set the communication parameters for all nodes to the same settings.
  (Data transfer rate 9600 bps, data bits: 8, stop bits: 1, parity: none)

(2) Measurement parameter setting

[Measure] → [Setup] or F4

Toolbar 

Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method I.



(3) Measurement start

[Measure] → [Start] **or** **F5**

Sets the particle counter to the measurement condition and starts measurement.

Note:

- The alarm function of the particle counter is independent of the RP Monitor alarm function.
- If an unrecoverable error (disk full error, etc.) occurs during measurement, the measurement stops.

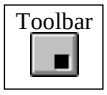
(4) Measurement restart

[Measure] → [Restart]

This restarts a particle counter whose power went off during a measurement. It does not affect other particle counters currently carrying out measurement.

(5) Measurement end

[Measure] → [Stop] **or** **F3**



After confirmation, measurement stops. The processed measurement values (Min. Ave. Max. Times) are written to the measurement data file.

6.10 Measurement Method J: KM Memory Receive Multi Mode

With this mode, a particle counter with a buffer memory (such as the KR-12A) can be used for measurements in the field, storing measurement data temporarily in the buffer. After measurements are completed, the particle counter is connected to a Multi Mode (M) sub line, for storing measurement data on a computer.

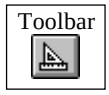
(1) Preparations

Refer to D: KM Memory Receive Mode.

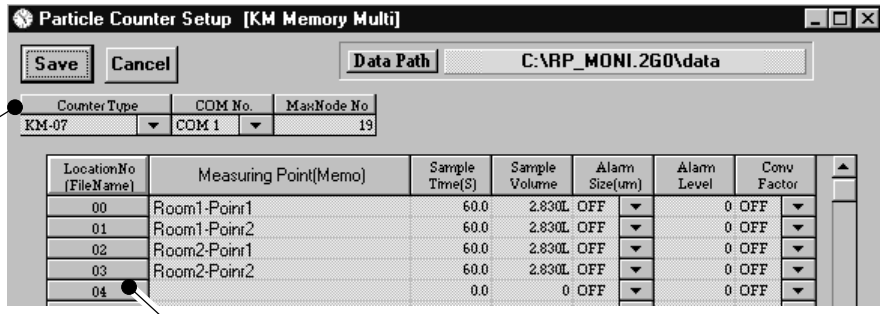
(2) Measurement parameter setting

[Measure] → [Setup] or F4

Toolbar



This is basically the same as for D: KM Memory Receive Mode, but the MaxNodeNo setting must be added. All particle counters must be of the same model.
Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method J.



First select the Counter Type.

This becomes the location number and is used in the file name (00 to 99).

(3) KM setup

Refer to D: KM Memory Receive Mode.

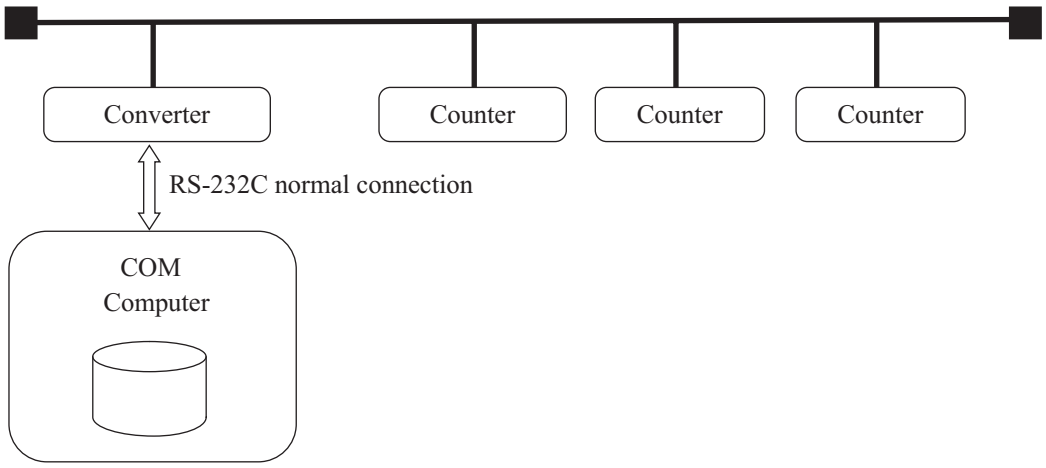
(4) Mobile measurement

Refer to D: KM Memory Receive Mode.

(5) Measurement data receive/store

Make connections to the computer as shown below, to store all measurement data together.

As shown below, connect the particle counters to the COM port of the computer, via bus line, sub line, and adapter.

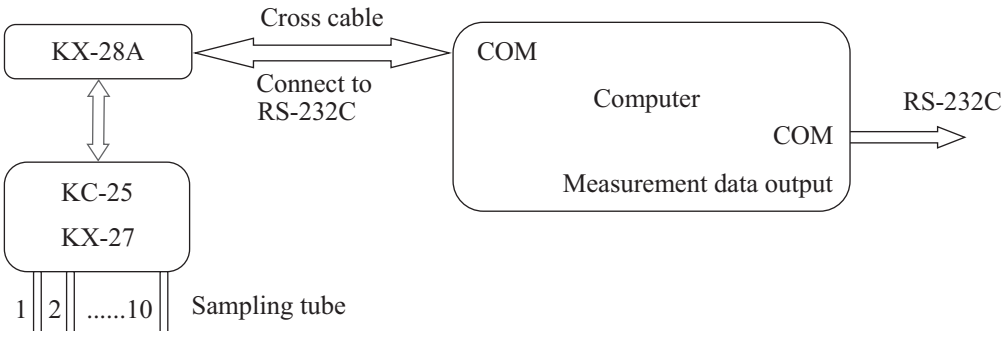


For other explanations, refer to D: KM Memory Receive Mode.
The measurement data file name convention is YY (year) MM (month) DD (day) + LOC number.

6.11 Measurement Method K: KX-28A Tube Multi-Point Mode

(1) Particle counter connection and setup

[1] As shown below, connect the particle counter to the COM port of the computer.



[2] Equipment setup

KX-28A

- Leave the RS-232C interface settings in the factory default condition.
- Measurement channel setting CHANNEL ON/OFF 1 to 10 Ch
- Sample volume setting SAMPLE VOLUME 0.01 to 10.00 CF
- Measurement period setting Minimum setting: PERIOD (SAMPLE + PURGE) * Number of channels Unit: minutes
- Purge time setting PURGE 1 to 10 minutes
- Internal clock setting is RP Monitor start time setting.
  This is set automatically by the internal clock of the PC when [Measure] and then [Start] is selected.

KC-25

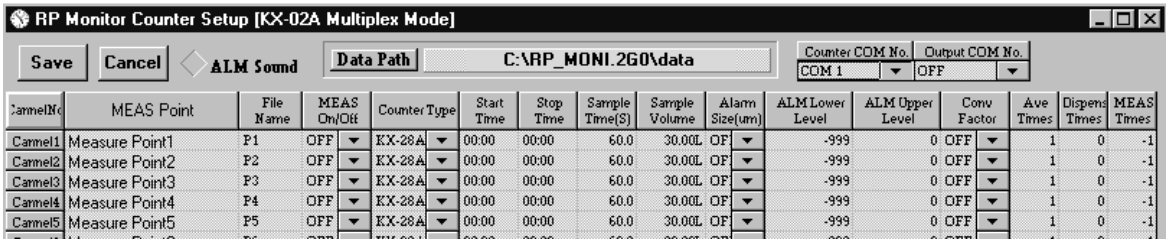
- Set SAMPLE VOLUME to "MAN".

(2) Measurement parameter setting example

[Measure] → [Setup] or F4

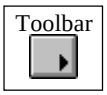
Toolbar 

Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method K.



(3) Measurement start

[Measure] → [Start] or F5



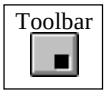
Starts measurement with the particle counters.

Note:

- When starting measurement, verify that the READY indicator of the controller KX-28A is lit. If the KX-28A is not set up correctly, the READY indicator will not light. Set the particle counter to the measurement stop condition.
- When measurement is started, the KX-28A controller is set to the remote condition, making the controls on the operation panel inactive.
- In this mode, only the RM Monitor command for measurement start/stop is used for particle counter control.
- The sample volume setting of the particle counter is determined not by RP Monitor but by the KX-28A.
- If an unrecoverable error (disk full error, etc.) occurs during measurement, the measurement is stopped.

(4) Measurement end

[Measure] → [Stop] or F3

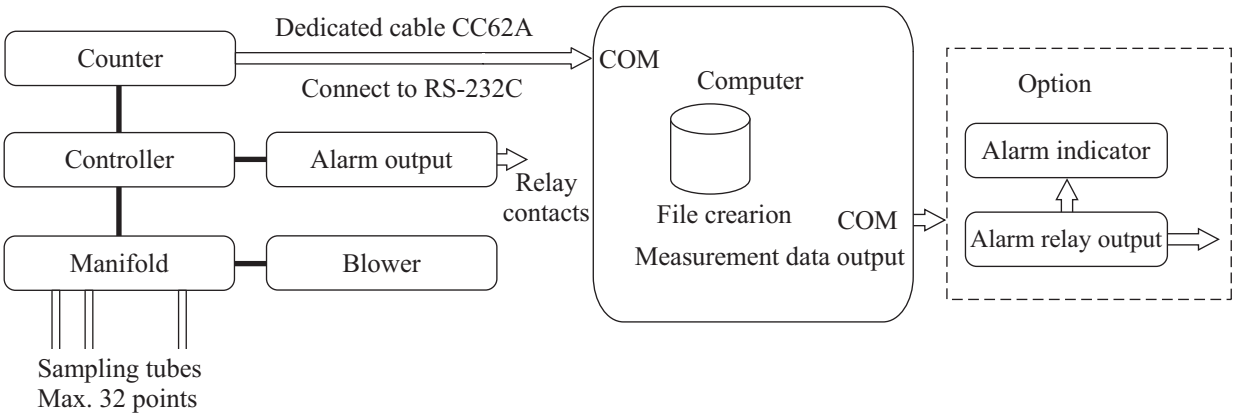


After confirmation, measurement with the particle counters is stopped. The processed measurement values (Min. Ave. Max. Times) are written to the measurement data file.

6.12 Measurement Method L: Manifold Multi-Point Mode (M)

(1) Particle counter connection and setup

[1] Connect the particle counter to the COM port of the computer as shown below.



[2] Measurement sequence program at manifold controller

The manifold performs measurement in up to 100 steps in programmed order, as shown below. For each step, the port to be measured can be set as desired.

For details, please refer to the documentation of the manifold controller.

	Step	Measurement port
Measurement sequence	1	20
	2	3
	3	1
	4	2
	5	4
	6	11
	•	•
	100	18

[3] Particle counter program

By programming the "Cycles" and "Location" settings, various measurements are possible. The combinations are listed in the table below.

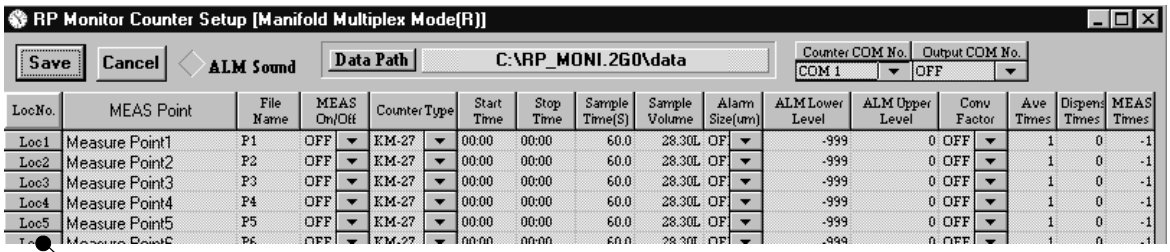
For details, please refer to the documentation of the particle counter.

Cycles Number of measurement cycles in each step	Location Measurement sequence repetitions (0 means endless repetition)	Operation
0	0	Measurement is repeated in 1-second intervals at current port, using measurement time programmed at particle counter.
1	0	Default setting. Each port is measured once, using measurement sequence programmed at manifold controller. This operation is then repeated.
1	1 or more	Each port is measured once, using measurement sequence programmed at manifold controller. This operation is repeated for number of times set with "Location".
2 or more	0	Each port is measured for number of times set with "Cycles", using measurement sequence programmed at manifold controller. This operation is then repeated.
2 or more	1 or more	Each port is measured for number of times set with "Cycles", using measurement sequence programmed at manifold controller. This operation is repeated for number of times set with "Location".

(2) Measurement parameter setting

[Measure] → [Setup] or [F4]

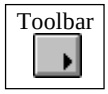
Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method L.



Specify location number set at particle counter

(3) Measurement start

[Measure] → [Start] or [F5]



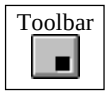
Starts measurement.

Note:

- RP Monitor only receives data and controls measurement start/stop.
- The following items cannot be set with the RP Monitor program:
  Measurement point selection and sequence (set at manifold controller)
  Measurement time and interval (set at particle counter)
- If an unrecoverable error (disk full error, etc.) occurs during measurement, the measurement stops.

(4) Measurement end

[Measure] → [Stop] or [F3]

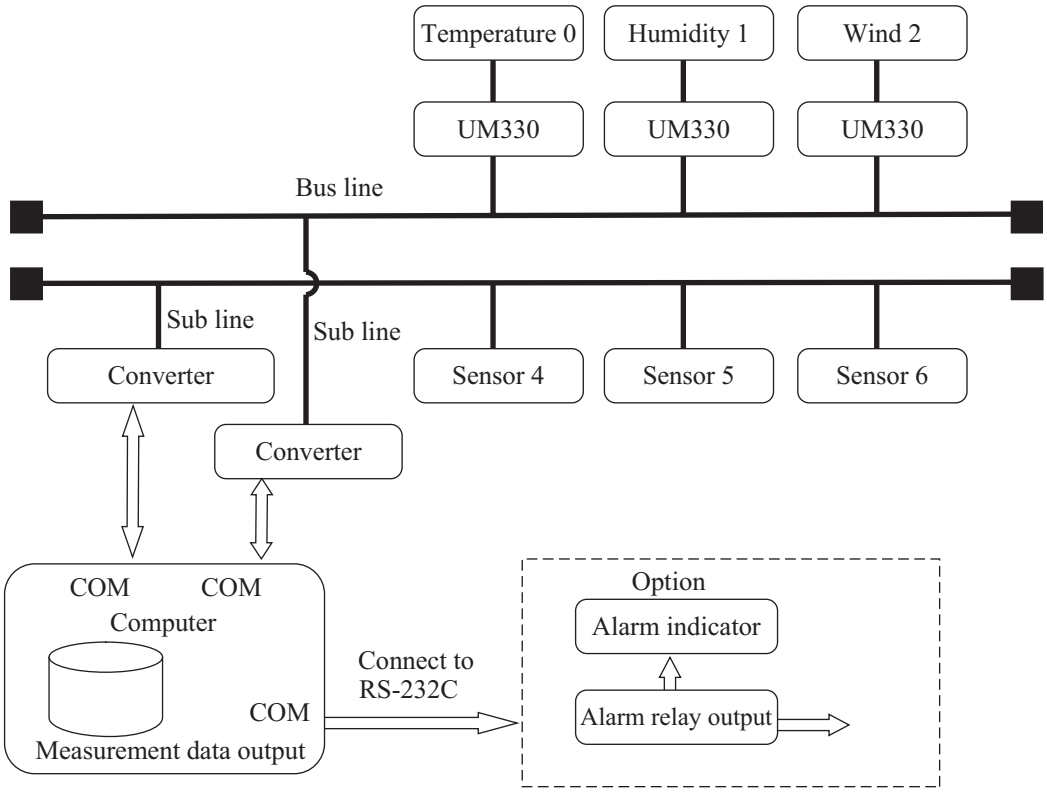


RP Monitor stops the measurement. The processed values (Min, Ave, Max, Times) are written to the measurement data file.

6.13 Measurement Method M: Multi Mode (R) Plus 330 Mode

(1) Particle counter connection and setup

[1] As shown below, connect the particle counters and temperature and humidity sensors to the COM ports of the computer, via bus line, sub line, and two adapters.



[2] Particle counter setup

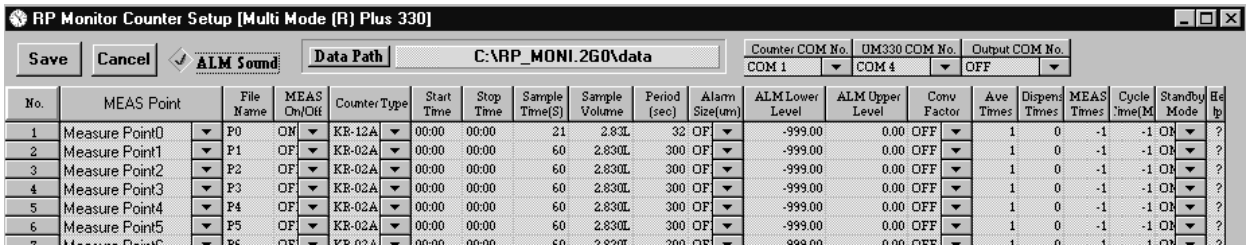
Refer to the documentation of the particle counter to set the node address.

(Any address between 0 and 19 can be chosen, but node addresses must be unique.)

(2) Measurement parameter setting

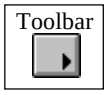
[Measure] → [Setup] or F4

Refer to section 7 "Measurement Steps for Each Measurement Method" and set the parameters for measurement method M.



(3) Measurement start

[Measure] → [Start] **or** **F5**



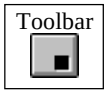
Sets the particle counter to the measurement condition and starts measurement.

Note:

- The alarm function of the particle counter is synchronized to the RP Monitor alarm function. When "Alarm = Y" is set at RP Monitor, the alarm relay contacts of the particle counter are shorted. When Alarm becomes "N", the relay contacts are released.
- The alarm function of the UM-330 is not synchronized to the RP Monitor alarm function. It operates independently.
- When the KZ-45A is used, certain limitations regarding the displayed information apply. For details, please refer to the documentation of the KZ-45A.

(4) Measurement end

[Measure] → [Stop] **or** **F3**



After confirmation, measurement stops. The processed measurement values (Min. Ave. Max. Times) are written to the measurement data file.

7. Measurement Steps for Each Measurement Method

[Measure] → [Setup] or F4

Toolbar 

Before using the particle counters for measurement, the measurement parameters must be set. Parameters include particle counter type, measurement time, sample time, alarm, value conversion, etc. Parameters can only be set or changed while measurement is stopped. Changing parameters while measurement is in progress is not possible.

Note:

This explanation applies to all measurement modes. The applicable modes are noted for each parameter, in the form

Measurement mode A:B:C:D:E:F:G:H:I:J:K:L:M

For easier identification, we recommend that you circle the measurement mode that you are using.

Example:

Measurement mode Ⓐ:B:C:D:E:F:G:H:I:J:K:L:M

- A: RS-232C mode
- B: Read only RS-232C mode
- C: KR-12A memory receive mode
- D: KM memory receive mode
- E: Read only multi (R) from bus line
- F: Read only multi (R) plus 330 from bus line
- G: Read only from data file mode (LAN)
- H: Multi mode (R)
- I: Multi mode (M)
- J: KM memory receive multi mode
- K: KX-28A tube multi-point mode
- L: Manifold multi-point mode (M)
- M: Multi mode (R) plus 330 mode

COM No. Measurement mode A:B: : : : : : : : : : :

COM port number of particle counter connected via serial interface. RP Monitor performs communication on this port.

Node No. Measurement mode : : : :E:F:G:H:I: : : :M

Enter the node number (node address) assigned to the particle counter. For multi-point measurements, the node address is used to identify the hardware (particle counter). For information on how to set the node address, please refer to the documentation of the particle counter.

Location No. (FileName) Measurement mode : :C:D: : : : : :J: : :

Measurement point number stored on particle counter at time of measurement (measurement mode D:J) or number allocated at receiving end (measurement mode C:). This number is used as two characters of the measurement data file name.

Location No. Measurement mode : : : : : : : : : : :L:

Measurement point number (LOC number) set at particle counter during measurement. When receiving data, this is used for data identification. The measurement data file name is as set by the "FileName" item.

Channel No. Measurement mode : : : : : : : : : :K: :

This refers to the channel number of particle counters for tube multi-point measurement. Choose the number to match the sampling tube number. When receiving data, this is used for data identification. The measurement data file name is as set by the "FileName" item.

File Name — Measurement mode A:B: : :E:F:G:H:I: :K:L:M

Enter a two-character code for the measurement point. RP Monitor creates one data file per measurement point per day and uses this code as the last two characters of the file name. Therefore it is necessary to change the File Name when performing measurement at the same location but with different parameters.

Example

950701xx.TXT

- Text file extension
- MEAS Point code
- Measurement date yy (year) mm (month) dd (day)

In measurement mode other than Read only mode, the measurement point and measurement parameters entered once will be automatically stored in a file. From the next time onward, it suffices to select the measurement point from the MEAS Point combo box. This will set all setup items. To delete a measurement point from the combo box, select it and then set Meas On/Off to Off, so that the MEAS Point field is blank, and press the Enter key. The point will not be listed during the next particle counter setup run.

This is effective for measuring multiple measurement points with a single particle counter.

MEAS Point — Measurement mode A:B: :D:E:F:G:H:I:J:K:L:M

A measurement point name can be entered here. The entered string is stored and displayed together with the measurement result.

Label — Measurement mode : :C: : : : : : : : :

A measurement point name can be entered here. The entered string is stored and displayed together with the measurement result. Only alphanumeric characters can be used here. Enter the same name at the particle counter. The received measurement data are allocated a file name (Location No.) based on the label entered here.

MEAS On/Off — Measurement mode A: : : : : :H:I: : : :M

Selects whether the connected particle counter is to be used for measurement (ON) or not (OFF). When ON is selected, the particle counter for that channel is controlled by the software. When OFF is selected, measurement is not carried out with that particle counter.

MEAS On/Off — Measurement mode :B: : :E:F:G: : : :K:L:M

Selects whether measurement data are received from the connected particle counter (ON) or not (OFF). When OFF is selected, measurement data in that channel are discarded.

Counter Type Measurement mode A:B:C:D:E:F:G:H:I:J:K:L:

The type of the connected particle counter can be selected from a combo box. Be sure to select the correct type. If the particle counter you are using is not on the list, please contact Rion Corporation.

Out of the list, entries with a special meaning are described below.

KC-03_.5:	KC-03 modified for 0.5, 1, 2, 5, 10 um particles
KC-20_5:	KC-20 modified for 5, 10, 20, 30, 50 um particles
KA-80A5:	KA-80A modified for 5 particle sizes (0.3 um, 0.5 um, 1 um, 2 um, 5 um)
KA-80B5:	KA-80B modified for 5 particle sizes (0.3 um, 0.5 um, 1 um, 2 um, 5 um)
KS-17A4:	KS-17A modified for 4 particle sizes (0.06 um, 0.10 um, 0.15 um, 0.20 um)
KL-26_LD:	KL-26 with light source control capability
KL-27_LD:	KL-27 with light source control capability
KL-28T:	KL-28 with flow volume sensor
KM-07B_RHT:	KM-07B with connected temperature and humidity sensor
KM-07C_RHT:	KM-07C with connected temperature and humidity sensor
Temp:	Temperature sensor connected to UM-330
R/H:	Humidity sensor connected to UM-330
Diff. Pre_H2O:	Pressure differential sensor connected to UM-330 Unit: H20
Diff. Pre_Pa:	Pressure differential sensor connected to UM-330 Unit: _Pa
AM-09Low:	Wind velocity sensor connected to UM-330 Range: 0 to 2.5 m/s
AM-09High:	Wind velocity sensor connected to UM-330 Range: 0 to 25 m/s
KR-12A:	Measurement/display of 0.3 um, 0.5 um, 0.7 um, 1 um, 2 um, 5 um, TEMP, R/H
KR-12A_RHT:	Measurement/display of 0.3 um, 0.5 um, 0.7 um, 1 um, TEMP, R/H
KR-12A_6CH:	Measurement/display of 0.3 um, 0.5 um, 0.7 um, 1 um, 2 um, 5 um, TEMP, R/H
XP-04+Volts (mV):	Voltage (0 to 1000 mV) measured at XP-04
XP-04+TEMP:	Temperature (0 to 50ºC) measured at XP-04
XP-04+TEMP.Humi:	Temperature (0 to 50ºC), CH1 and humidity (0 to 100% RH), CH2 measured at XP-04

Start Time　　Measurement mode A: : : : : : :H:I: : : :M

Enter the time for the particle counter to start measurement. When Start Time and Stop Time are both set to 00:00, measurement is carried out continuously. Outside of the measurement time, the particle counter stops measurement.

Start Time　　Measurement mode　:B: : :E:F:G: : : : : :

Enter the time to begin receiving measurement data from the particle counter. When Start Time and Stop Time are both set to 00:00, data are received continuously. Outside of the measurement time, data from the particle counter are discarded.

Start Time　　Measurement mode　: : : : : : : : : :K:L:

Enter the time to begin receiving measurement data from the particle counter. When Start Time and Stop Time are both set to 00:00, data are received continuously. Outside of the measurement time, data from the particle counter are discarded. When one channel is within the measurement time, the measurement is started automatically.

Stop Time　　Measurement mode A: : : : : : :H:I: : : :M

Enter the time for the particle counter to stop measurement. When the time is exceeded, the particle counter stops measurement.

When Start Time and Stop Time are both set to 00:00, measurement is carried out continuously.

The Stop Time cannot be set to an earlier time than the Start Time.

Stop Time　　Measurement mode　:B: : :E:F:G: : : : : :

Enter the time to stop receiving measurement data from the particle counter. When the time is exceeded, the particle counter continues measurement, but measurement data are no longer received or stored.

Stop Time　　Measurement mode　: : : : : : : : : :K:L:

Enter the time to stop receiving measurement data from the particle counter. When the time is exceeded, the particle counter continues measurement, but measurement data are no longer received or stored. When all channels are outside the measurement time, the measurement is stopped automatically.

Sample Time (S) Measurement mode A: : : : : : : : : : : :

Enter the time for which the particle counter should perform measurement (in seconds). The volume to be measured is automatically displayed as the Sample Volume. The smallest possible setting is 1 second, and the maximum setting is 86400 seconds (24 hours). Sample Time accuracy of RP Monitor is ±1 second or within ±5%.

When measurement at actual measurement time ±1 second or within ±5% could not be carried out, a correction error is diagnosed and the particle count is converted to time.

Conversion equation:

Count = particle count × sampling time (s) / actual measurement time (s)

Note:

About built-in alarm function of particle counter

When a particle counter with built-in alarm function is used with RP Monitor, care must be taken when using alarm function of the particle counter. If RP Monitor is controlling the particle counter and the program stops, pauses, or crashes, alarm monitoring at the particle counter may be stopped or impaired.

Sample Time (S) Measurement mode : : : : : : :H:I: : : :M

Enter the time for which the particle counter should perform measurement (in seconds). The volume to be measured is automatically displayed as the Sample Volume. In the case of temperature or humidity sensors or similar, sampling is carried out once only within the Sample Time (S) setting.

The smallest setting depends on the number of connected units, as shown below. The maximum setting is 86400 seconds (24 hours).

Number of connected units	Minimum sample time (Sample)	Minimum measurement interval (Period)
1	10	20
2	10	21
3	11	22
4	11	23
5	12	24
6	12	25
7	13	26
8	13	27
9	14	28
10	14	29
•	•	•
15	17	34
•	•	•
20	19	39

Sample Time (S) Measurement mode :B:C: :E:F:G: : : :K:L:

Enter the measurement time set at the particle counter. Use the SAMPLE VOLUME setting of the particle counter (unit: CF etc.) and convert it into measurement time.

For example, if the setting at the particle counter for the flow rate is 30 L/s and the SAMPLE VOLUME = 1 CF, the following applies.

1 CF = 30 × 60 = 56.6 (unit: seconds)

Sample Time (S) Measurement mode : : :D: : : : : :J: : :

Enter the measurement time set at the particle counter so that a match is achieved. Enter the setting to obtain the sample volume.

Sample Volume Measurement mode A:B:C:D:E:F:G:H:I:J:K:L:M

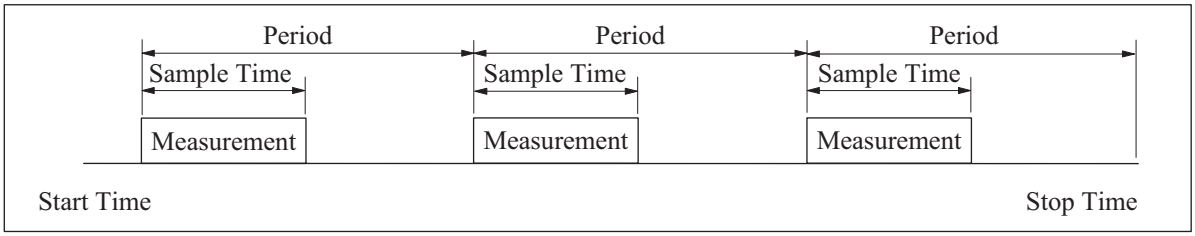
Indicates the actually measured amount (in units of L, CF, etc.). Displayed automatically when Sample Time is input. The item is for display only, it cannot be changed directly. For process particle counters, the sample volume is not determined, and this field only shows "----".

Period Measurement mode A: : : : : : : : : : : :

Enter the cycle duration (seconds) in which the particle counter repeats measurement. This should be Sample Time + time required for Auto Cal + 1 s or more. The minimum setting is 2 seconds, and the maximum 86400 seconds (24 hours).

Period Measurement mode : : : : : : :H:I: : : :M

Enter the cycle duration (seconds) in which the particle counter repeats measurement. The minimum setting depends on the number of connected units, as shown in the Sample Time table above. The maximum setting is 86400 seconds (24 hours).



Alarm Size (um) Measurement mode A:B:C:D:E:F:G:H:I:J:K:L:M

RP Monitor allows alarm comparison. After measurement of a certain volume, the result is converted into a standard value using the Conv. Factor and then compared to the alarm value. When the converted value exceeds the alarm level set for the specified Alarm Size, and when a real-time window has been opened, the indication "Alarm = Y" is shown in red, and "Alarm = Y" is also stored in the measurement data file.

When an optional alarm unit is connected (in some measurement modes, no alarm unit can be connected), relay contacts are closed and can be used to operate a rotating warning light or buzzer.

When Alarm Size is set to OFF, no alarm comparison is carried out.

Alarm Upper Level Measurement mode A:B:C:D:E:F:G:H:I:J:K:L:M

Enter the upper limit for alarm comparison. After measurement of a certain volume, the result is converted into a standard value using the Conv. Factor and then compared to the alarm value. When the converted value is lower than the alarm level set for the specified Alarm Size, "Alarm = Y" is output.

When Alarm Size is set to OFF, no alarm comparison is carried out.

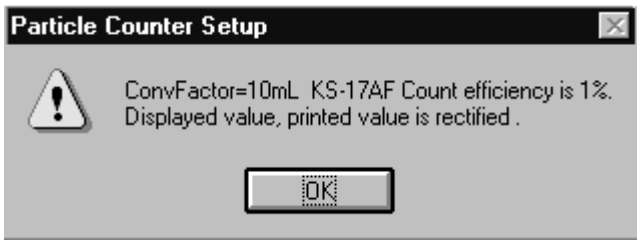
Alarm Lower Level Measurement mode A:B: : :E:F:G:H:I: :K:L:M

Enter the lower limit for alarm comparison. After measurement of a certain volume, the result is converted into a standard value using the Conv. Factor and then compared to the alarm value. When the converted value is lower than the alarm level set for the specified Alarm Size, "Alarm = Y" is output.
When Alarm Size is set to OFF, no alarm comparison is carried out.

Conv. Factor Measurement mode A:B:C:D:E:F:G:H:I:J:K:L:M

The particle count measured by the particle counter is converted to the unit specified by this item. All particle counts displayed by RP Monitor are the values after conversion. However, data files created by RP Monitor contain the raw data before conversion.
Measurement data for temperature, humidity, etc. are not converted.
When Conv. Factor is set to a value other than OFF, count values are displayed with decimal point resolution.

When you click on SAVE, the following message may be displayed, indicating that the particle counter display value has been compensated according to a count efficiency ratio. (As of February 2001, this applies only to KS-17.)



- When Conv. Factor is set to OFF, the raw count is displayed.
- When Conv. Factor is set to a value other than OFF, the count value is compensated by the count efficiency ratio.

Example 1: Conv. Factor = OFF, (KS-17) measurement time 1 min., count value 5, indication 5

Example 2: Conv. Factor = 10 mL, (KS-17) measurement time 1 min., count value 5, indication 500

Dispense Times — Measurement mode A:B: : :E:F: :H:I: :K:L:M

Specifies the number of blank measurements. During the specified interval, measurement data are displayed but are not stored in a data file, and real-time graph display processing is not carried out. Use this for installations with long sampling tubes or when changing the sample volume of a syringe sampler.

Ave Times — Measurement mode A:B: : :E:F: :H:I: :K:L:M

Enter the shift average count. When "1" is entered, no shift averaging is carried out. Settings of 2 or higher cause all values displayed and stored by RP Monitor to be subject to shift averaging. The data before averaging (raw data) are discarded. Use this when the measurement data fluctuate considerably.

Example: Ave Times = 3

Particle counter count	10 → 20 → 30 → 40 → 50 → 30 → 10
RP Monitor count	× → × → 20 → 30 → 40 → 40 → 30
RP Monitor real-time display (Count)	1/3 → 2/3 → 1 → 2 → 3 → 4 → 5

MEAS Times — Measurement mode A:B: : :E:F: :H:I: :K:L:M

Measurement automatically stops after the specified number of times. After measurement was stopped, it will not start again also at the next start time. Use this setting when making measurements with a syringe sampler. It can be used to automatically stop measurement before running out of sample fluid. When a value of "-1" is entered, measurement is carried out continuously. In relation to the Stop Time setting, the setting that is fulfilled first has priority.

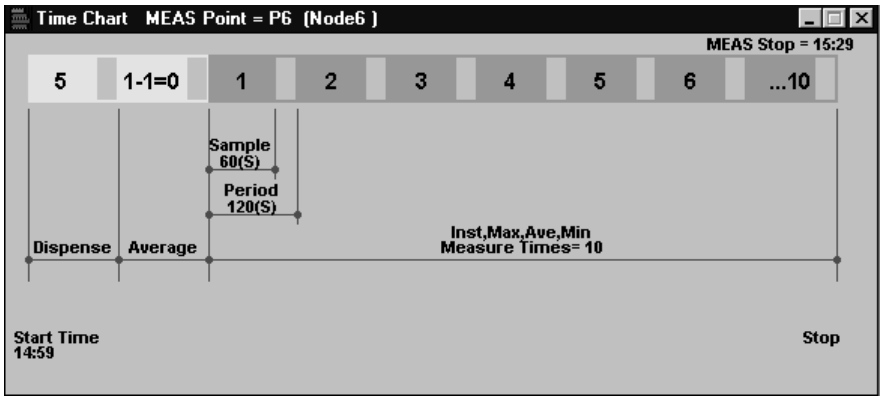
Standby Mode — Measurement mode A: : : : : :H:I: : :L:M

This setting serves for automatic control of the particle counter light source and pump.
When set to "On", particle counters with a gas laser light source will operate as follows. When measurement pause is more than 60 minutes, the light source and pump will be turned on 10 minutes before measurement, and will be turned off 1 minute after measurement. Particle counters with a laser diode light source will operate as follows. When measurement pause is more than 3 minutes, the light source and pump will be turned on 1 minute before measurement, and will be turned off 1 minute after measurement. Measurement starts on full 00 minutes (xx:xx:00). When the setting is "Off", light source and pump are not automatically controlled and measurement starts immediately.
In installations where the particle counter is always switched on, such as for clean-room monitoring, the setting should be "On" to reduce wear of the light source and pump.

Help ?

Measurement mode A: : : : : : :H:I: : :L:M

Displays the current measurement time chart. The example below is for the settings Sample = 60 seconds, Period = 120 seconds, Dispense Times = 5, MEAS Times = 10.



Syringe Mode

Measurement mode A: : : : : : : : :J: : :

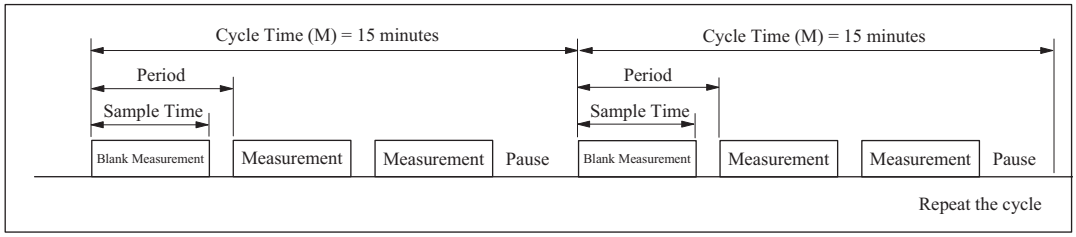
When Syringe Mode is set to ON, no stop command is sent to the particle counter at the end of each sampling cycle. This allows correct measurement when using a syringe sampler. (When using a syringe sampler, the stop command is issued by the syringe sampler.)

Cycle Time (M)

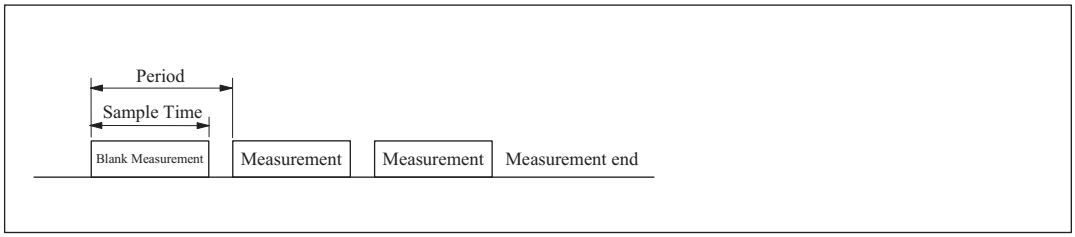
Measurement mode A: : : : : : :H:I: : : :M

When you enter the number of measurements (Meas Times) and cycle time (unit: minutes), measurements are carried out at the interval set here. With an input of "-1", measurement terminates then the number of measurements has been carried out.

A measurement example for a setting Dispense Times (blank measurement count) setting of 1, MEAS times (measurement times) setting of 2, and CycleTime (repeat time) setting of 15 minutes is shown below.



A measurement example for a setting Dispense Times (blank measurement count) setting of 1, MEAS times (measurement times) setting of 2, and CycleTime (repeat time) setting of -1 is shown below.

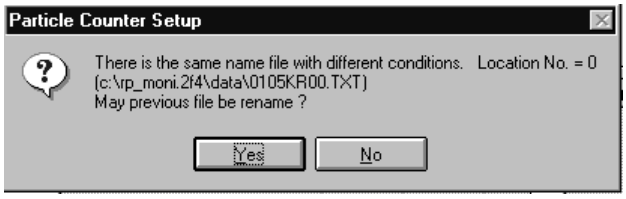


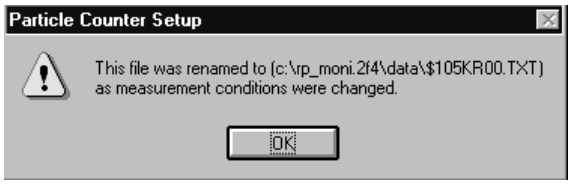
Save

Measurement mode A:B:C:D:E:F: :H:I:J:K:L:M

Input the measurement conditions for particle counter setup. When the updated items are correct, click on the [Save] button. When the button is clicked, the updated items become effective and are stored in the default value file.

If a measurement data file has already been created with the conditions before the change, data cannot be added to this file after the change. Therefore a confirmation message appears and the name of the already created file is changed. The name change is effected by adding a $ to the beginning of the name. With each rename action, the $ moves one place to the right (example: 9$50101aa.txt). Therefore up to 8 rename actions are possible. Note that the file will be deleted when this number is exceeded.





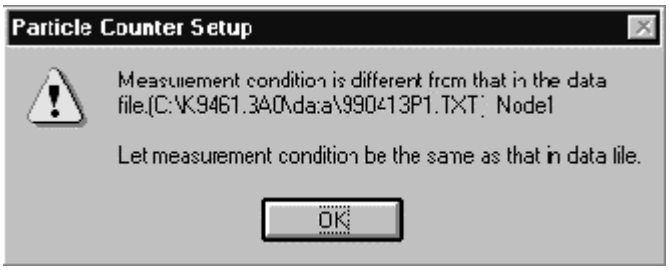
Approximate required disc capacity for storing measurement data is shown in the table below. For 5-channel type particle counters, the reference model is KC-01C, and for 2-channel type particle counters the reference model is KL-28.

	Measurement data for 1 day		Measurement data for 30 days		Measurement data for 1 year	
Measurement cycle	KL-28	KC01C	KL-28	KC-01C	KL-28	KC-01C
60 min.	1.4	2.0	33.4	48.2	396.9	574.2
30 min.	2.5	3.6	66.4	96.0	793.4	1,147.9
10 min.	6.9	10.0	198.6	287.3	2,379.7	3,442.9
5 min.	13.5	19.5	396.9	574.2	4,759.1	6,885.4
1 min.	66.4	96.0	1,983.1	2,869.2	23,794.1	34,425.4
30 sec.	132.5	191.7	3,965.9	5,737.9	47,587.8	68,850.4
10 sec.	396.9	574.2	11,897.2	17,212.9	142,762.8	206,550.4
5 sec.	793.4	1,147.9	23,794.1	34,425.4	285,525.3	413,100.4

KL-28 header approx. 137 + 47 bytes * (number of measurements per day + 4 (Ave)) Unit: KB
KC-01C header approx. 154 + 68 bytes * (number of measurements per day + 4 (Ave))

Save Measurement mode : : : : : :G: : : : : :

Match the particle counter setup to the master RP Monitor.
When the updated items are correct, click on the [Save] button. When the button is clicked, the updated items become effective and are stored in the default value file.
If a measurement data file has already been created with the conditions before the change, a confirmation message appears. Be sure to match the settings with those of the master RP Monitor.



Cancel Measurement mode A:B:C:D:E:F:G:H:I:J:K:L:M

Allows terminating setup without accepting changed items. Click on this button to close the setup window.

ALM Sound Measurement mode A:B: : :E:F:G:H:I: :K:L:M

When this is checked, a sound is produced by the PC when the "Alarm = Y" condition applies. The sound is produced when any of the nodes becomes "Alarm = Y". The sound stops when all nodes have become "Alarm = N".

To temporarily turn off the sound, click on the tool bar. 

RP Monitor uses the general Windows 95 alarm sound.

The alarm sound of RP Monitor plays the file RP_ALM.WAV located in the same folder as the program. By overwriting this file, you can change the alarm sound to any other WAV file, if desired.

Sound Test Measurement mode A:B: : :E:F:G:H:I: :K:L:M

Click here to play the RP Monitor alarm sound. This allows you to test the sound during measurement, even if not in the Alarm = Y condition.

Data Path Measurement mode A:B:C:D:E:F: :H:I:J:K:L:M

Specifies the disk drive and folder name where measurement data are to be stored.

Note:

When several particle counters are controlled or when measurements are carried using a cycle of several seconds only, a fast-responding environment is necessary. Therefore you should specify a hard disk, not a floppy disk as target for saving data (Data Path).

Data Path Measurement mode : : : : : :G: : : : : :

Specifies the disk drive and folder name where measurement data are to be monitored and received.

To specify the file system of a computer, use the network functions to assign a network drive, and then enter that drive name.

Counter COM No. Measurement mode : :C:D:E:F: :H:I:J:K:L:M

For multi-point measurement, the particle counter is connected to the COM port on the computer, either via an adapter (RS-485 interface) or directly (RS-232C interface). Select the number of the COM port to which the particle counter is connected. If not used, set this item to OFF.

UM330 COM No. Measurement mode : : : : : : : : : : :M

For temperature and humidity measurements, the UM-330 is connected to the COM port of the computer using an adapter. Select the number of the COM port to which the adapter is connected. If no adapter is used, set this item to OFF.

Output COM No. Measurement mode A:B: : :E:F: :H:I: :K:L:M

An external alarm relay unit (option) or contamination indicator panel (option) can be driven by measurement data output via a COM port. Select the number of the COM port here. If the feature is not used, set this item to OFF. For information on the output format, see the end of this documentation.

Max Node No. Measurement mode : : : : : : : : :J: : :

When memorized measurement data are received simultaneously, the node address (LOC number) of the last particle counter is entered here. RP Monitor will receive measurement data from particle counters up to and including that node address.

Note:

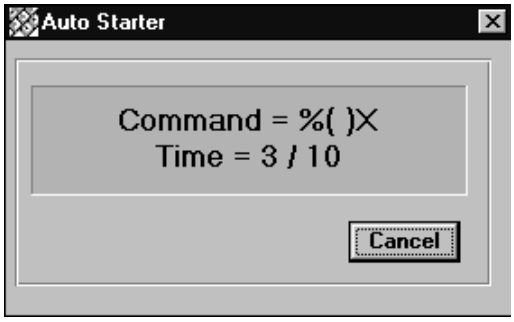
Using keyboard shortcuts makes the entry process easier: Copy = [Ctrl] + [C], Cut = [Ctrl] + [X], Paste = [Ctrl] + [V])

8. Automatic Measurement Start

Click on [Options] → [Measure Auto Start]

The next time RP Monitor is started up, measurement begins automatically. This option serves for unmanned installations where carrying out measurement without mouse input is desirable.

If RP Monitor is registered in the Windows startup folder, this function allows automatic measurement start when power to the computer is turned on.



Options can also be specified when starting RP Monitor. For example, it is possible to start the program, automatically open a real-time graph in full screen view, and start measurement automatically. This is accomplished by writing key macro commands on the 3rd line of the file RP_MONI. ini located in the program folder. (Key macro command syntax is proprietary to RP Monitor. Please contact Kyushu Rion Corporation for information.)

When the file RP_MONI. ini has been edited, you must restart RP Monitor for the changes to take effect.

Example 1

Automatically open real-time graph and start measurement.

Command: time010.{F2}.time003.%( )X{F2}%(-)X.time003.%(MS)

Action: Pause 10 seconds, open maximized real-time graph; pause 3 seconds, maximize display, pause 3 seconds, start measurement.

Example 2

Automatically open real-time graph and real-time numeric display, adjust size, and start measurement.

Command: time010.%( )X .time003.{F2} .time003.{F1} .time003.%(WT) .time003.%(-)S{DOWN}{UP 7}{ENTER} .time003.%(-)T%(-)S{UP}{UP 7}{ENTER} .time003.%(MS)

Action: Pause 10 seconds, maximize display, open real-time graph, open real-time numeric display, arrange windows as vertical tile, adjust menu box size, go down 1 step, go up 7 steps, Enter, move to next window, change size, go up 1 step, go up 7 steps, Enter, start measurement.

9. View

9.1 Map window

[View] → [Map] **or** **F6**

Toolbar

The current particle counter layout diagram with color-coded node icons for alarm indication and error indication is shown. From this window, it is possible to open a real-time history window and alarm window for each measurement point.

Node icon

Clicking on the icon brings up a sub window.

The icon can be moved by dragging it while holding down the Shift key. The new position will be memorized.

Clicking while holding down the Ctrl key rearranges the icons.

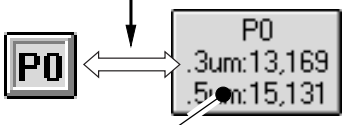
Clicking by holding the Shift key + Ctrl key toggles between two display styles.

The color of the icon during measurement has the following meaning.

Green: Alarm = N

Yellow: Measurement error has occurred

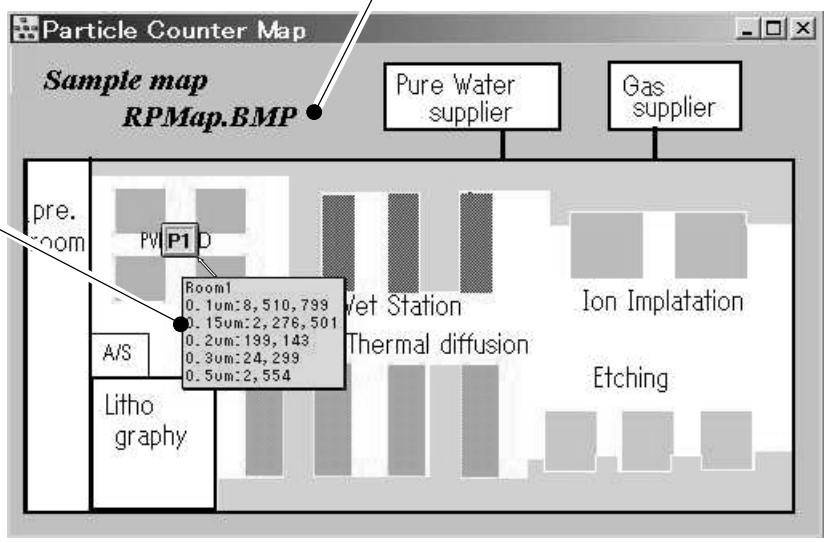
Red: Alarm = Y



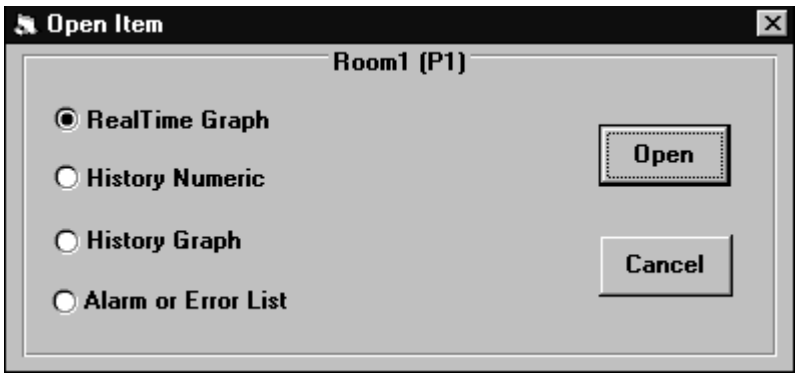
For channels shown with a large icon, set the real-time graph particle size ON/OFF switch for the corresponding node to Draw.

Double-clicking in the display brings up Paintbrush which can be used to edit the layout diagram. Save the result using the file name RP_MAP.BMP.

By holding the mouse cursor over a node icon for a while, tool tips will be displayed showing the latest measurement values. Note that the display will not be automatically updated when measurement values change.



- When the window is opened, a RPMAP.BMP file that exists in the program file folder will be shown. The display size is the size that was used when creating the file. (The size can be changed with ZOOM.)
- Clicking on a node icon brings up a window. From this window, you can open a real-time window or history window.



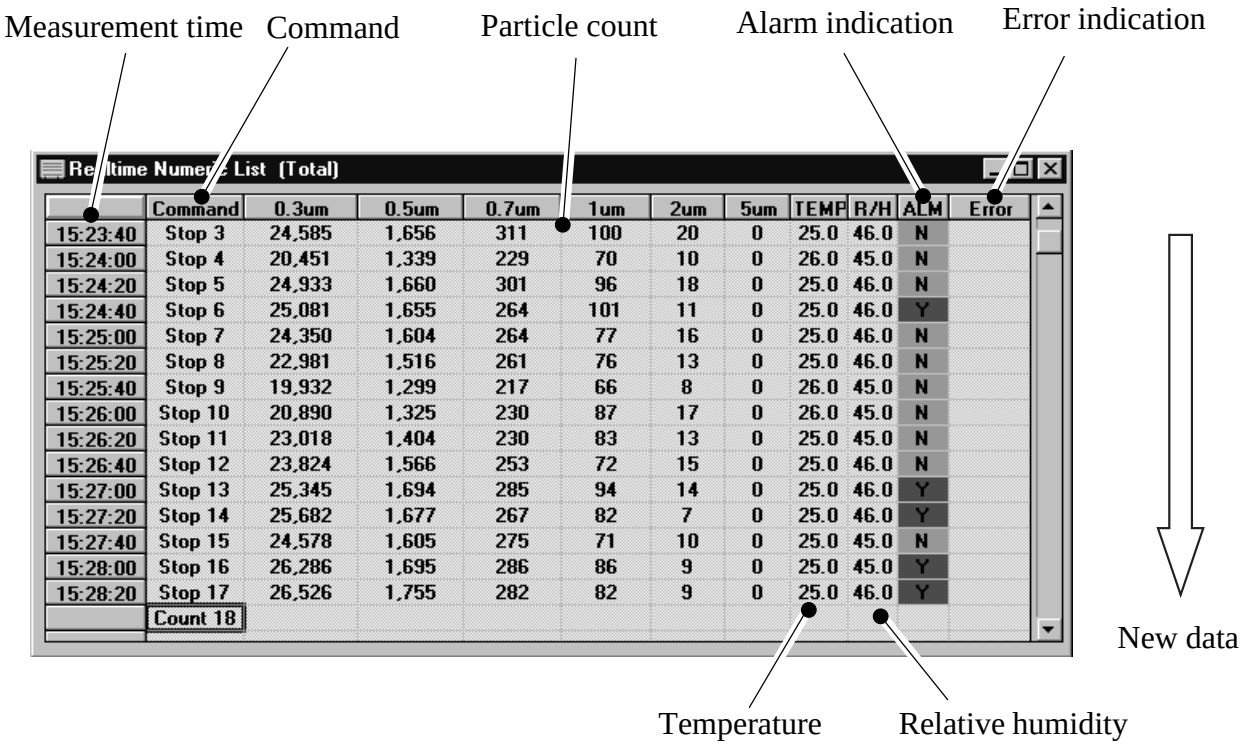
9.2 Real-Time Numeric List Window

[View] → [Real Time Open] → [Numeric] or F1

Toolbar

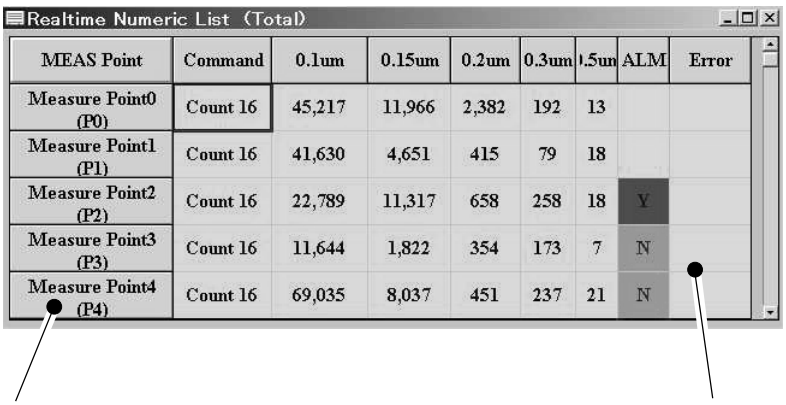
The commands and measurement results for all currently operating particle counters are shown.

For one-channel display, scrolling shows the history.



	Command	0.3um	0.5um	0.7um	1um	2um	5um	TEMP	R/H	ALM	Error
15:23:40	Stop 3	24,585	1,656	311	100	20	0	25.0	46.0	N	
15:24:00	Stop 4	20,451	1,339	229	70	10	0	26.0	45.0	N	
15:24:20	Stop 5	24,933	1,660	301	96	18	0	25.0	46.0	N	
15:24:40	Stop 6	25,081	1,655	264	101	11	0	25.0	46.0	Y	
15:25:00	Stop 7	24,350	1,604	264	77	16	0	25.0	46.0	N	
15:25:20	Stop 8	22,981	1,516	261	76	13	0	25.0	46.0	N	
15:25:40	Stop 9	19,932	1,299	217	66	8	0	26.0	45.0	N	
15:26:00	Stop 10	20,890	1,325	230	87	17	0	26.0	45.0	N	
15:26:20	Stop 11	23,018	1,404	230	83	13	0	25.0	45.0	N	
15:26:40	Stop 12	23,824	1,566	253	72	15	0	25.0	46.0	N	
15:27:00	Stop 13	25,345	1,694	285	94	14	0	25.0	46.0	Y	
15:27:20	Stop 14	25,682	1,677	267	82	7	0	25.0	46.0	Y	
15:27:40	Stop 15	24,578	1,605	275	71	10	0	25.0	45.0	N	
15:28:00	Stop 16	26,286	1,695	286	86	9	0	25.0	45.0	Y	
15:28:20	Stop 17	26,526	1,755	282	82	9	0	25.0	46.0	Y	
	Count 18										

For multi-channel measurement, results for all nodes are shown.



MEAS Point	Command	0.1um	0.15um	0.2um	0.3um	0.5um	ALM	Error
Measure Point0 (P0)	Count 16	45,217	11,966	2,382	192	13		
Measure Point1 (P1)	Count 16	41,630	4,651	415	79	18		
Measure Point2 (P2)	Count 16	22,789	11,317	658	258	18	Y	
Measure Point3 (P3)	Count 16	11,644	1,822	354	173	7	N	
Measure Point4 (P4)	Count 16	69,035	8,037	451	237	21	N	

Measerment location name + File name

Right-clicking inside the window toggles the background color between blue and white.

- Commands shown in the "Command" field

Reset: Reset command sent to particle counter.

Remote: Remote command sent to particle counter.

LD ON: Light source ON, pump ON commands sent to particle counter.

Active: UM-330 operates normally. Correct command response received.

Dispense 2: Blank measurement in progress. Two actions remaining.

Count 3: Measurement start command sent to particle counter (measurement count = 3).

Count 1/5: Shift average 5 set, current average count insufficient (data are being accumulated). Measurement data not yet ready.

Stop 3: Measurement stop command sent to particle counter (measurement count = 3).

Row Count 3:

Shows number of row in file being read in read-only file mode

Read: Data request command sent to particle counter (KM-07 only)

LD OFF: Light source OFF, pump OFF commands sent to particle counter.

9.3 Real-Time Graph Window

[View] → [Real Time Open] → [Graph] → [Select measurement location]

To open real-time graph for node 0 (COM1)

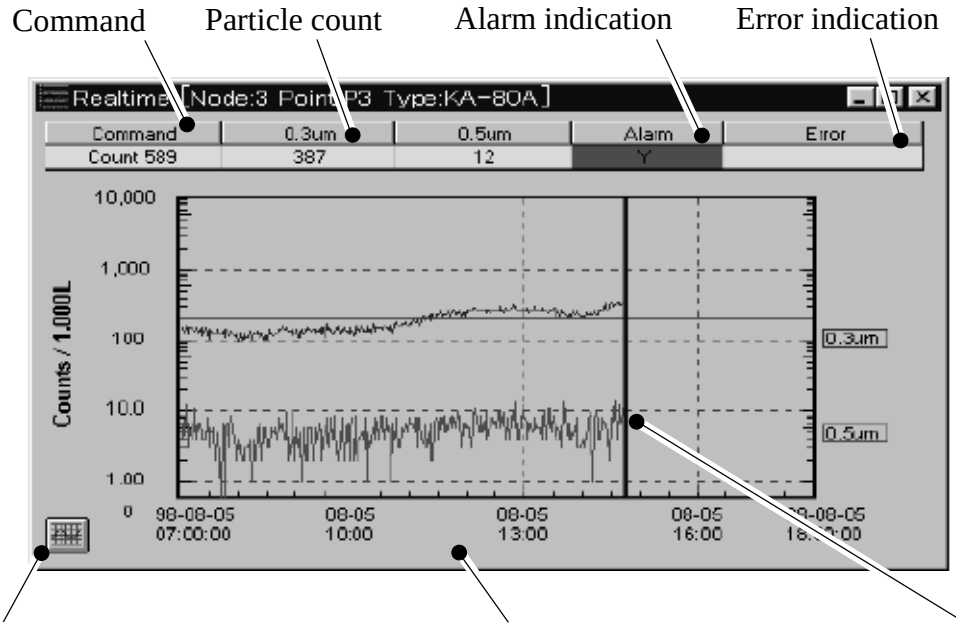
[View] → [Real Time Open] → [Graph] → [Node 0] or F2

Toolbar

To open a real-time graph for all measurement locations

[View] → [Real Time Open] → [Graph] → [All Points]

Toolbar



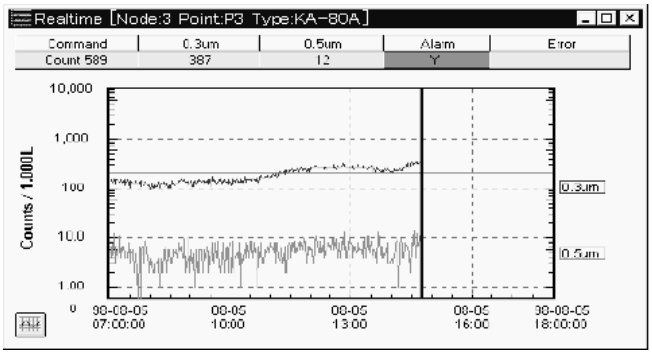
Clicking here brings up graph setup window.

Double-clicking switches between graph setup window and graph display.

Time marker

By right-clicking in the window during printing, the background color can be toggled between gray and white.

For easier legibility of the printout, the background is white.



Note:

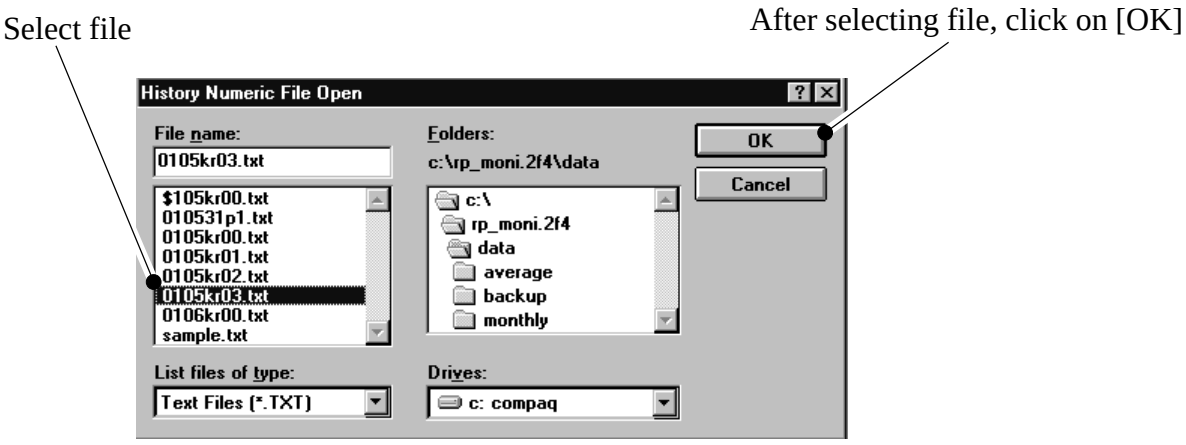
Only values above 0 can be plotted on the graph. Negative values cannot be plotted.

9.4 History Numeric Window

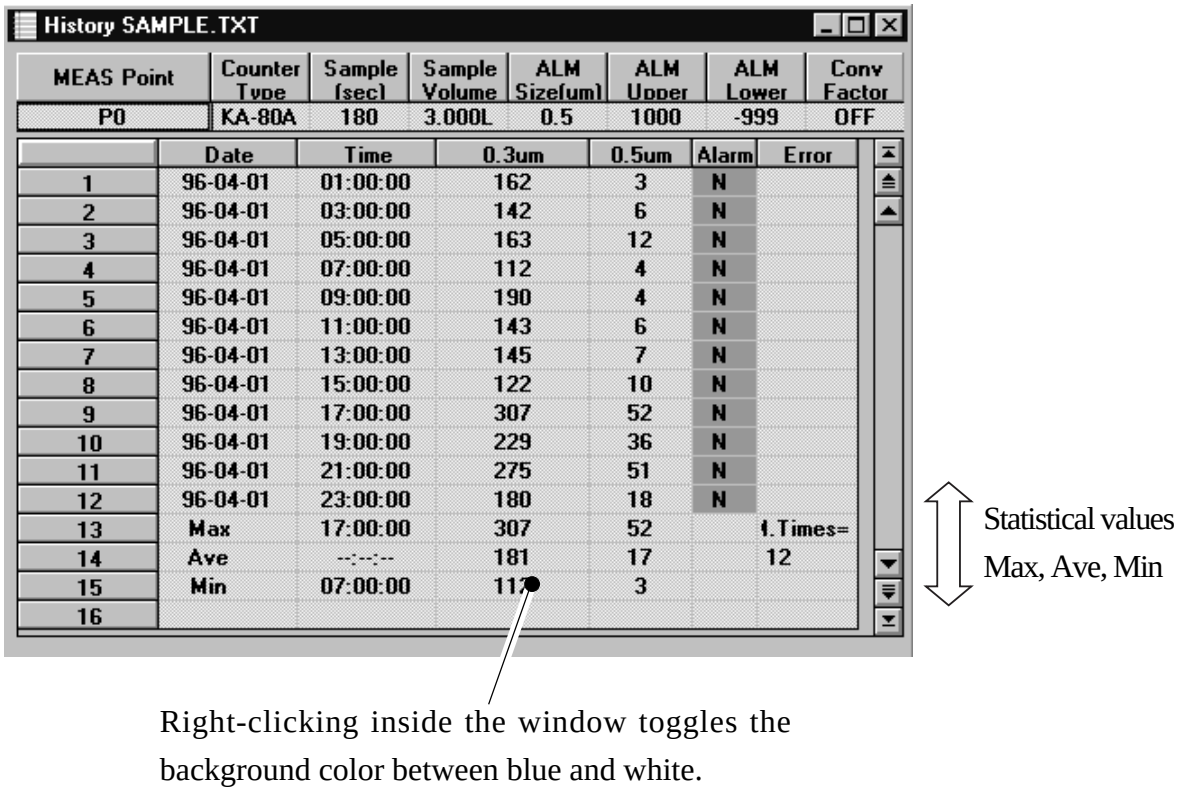
[View] → [History Open] → [Numeric]

A file selection dialog box opens. Select the desired file and click on [OK].

The file name convention is yy (year) mm (month) dd (day) + measurement point name.txt



When the file was loaded properly, the following kind of window appears. The last lines show the statistical values from start to end of measurement (maximum value and update time, average value, minimum value and update time, normal measurement count). The maximum, average, and minimum values are calculated separately for each particle size. The update time is the time for the smallest particle size channel (ch1). The particle count has been converted to the unit specified by the Conv. Factor.



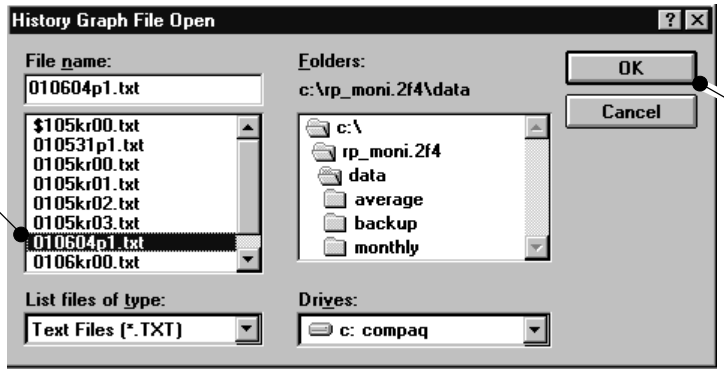
Right-clicking inside the window toggles the background color between blue and white.

9.5 History Graph Window

[View] → [History Open] → [Graph]

A file selection dialog box opens. Select the desired file and click on [OK].

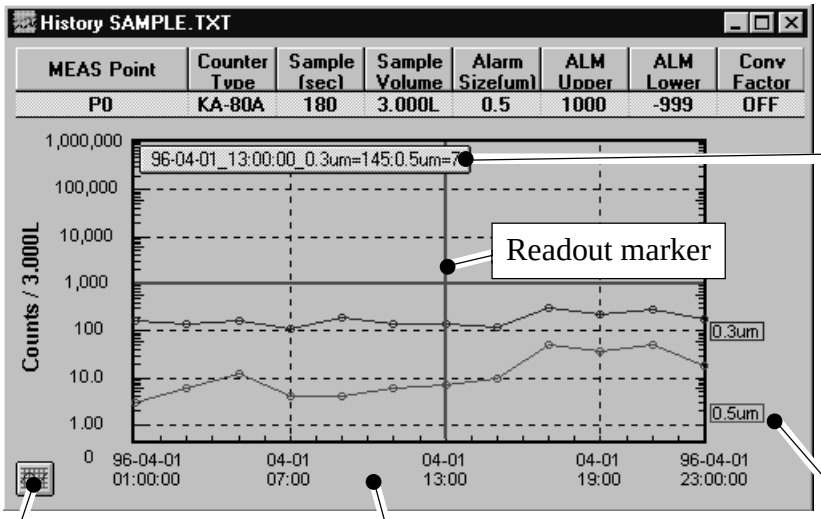
The file name convention is yy (year) mm (month) dd (day) + measurement point name.txt



Select file

After selecting file, click on [OK]

The following kind of window appears, and the measurement data for one day are shown in graphical form. The particle count has been converted to the unit specified by the Conv. Factor.



When "Readout" has been set to ON in graph setup, the mouse can be used to move the readout marker and read the value for that point.

Clicking here brings up graph setup window.

Double-clicking brings up graph setup window.

Particle size label shows position where count exceeded 0 for the first time.

Graph readout function

With the readout function, the following values can be read.

- Normal graph and integral graph shown for same time (point) → integral graph value
- Previous graph and normal (today's) graph shown for same time (point) → normal (today's) graph

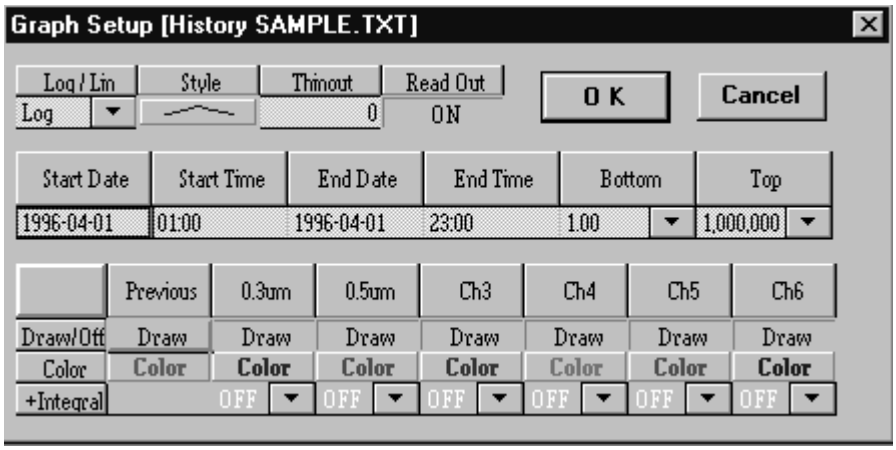
When the window size is reduced, the readout display automatically disappears.

When the window is small and number of measurements is high, the readout value shows the maximum value for that time (point).

The "← "and "→" arrow keys can also be used to move the readout marker.

9.6 Graph Setup

Clicking on the graph icon, or double-clicking on the X title (date) or the Y title (count unit) in the graph brings up the setup window. The time graph setup information is saved for each node separately when the setup information is modified.



Log/Lin: Selects a logarithmic scale or linear scale for the vertical axis of the graph.

Style: Selects the type of line used for the graph.

ThinOut: Number of points that are omitted. When the number of measurements is high, this is set automatically when the graph is opened, but it can also be changed in the setup window. When "0" is selected, all data points are displayed.

StartDate: Display start date for left end of graph

StartTime: Display start time for left end of graph

EndDate: Display end date for right end of graph

EndTime: Display end time for right end of graph

Bottom: Count value for lower end of graph

Top: Count value for upper end of graph

Previous: ON/OFF switch for displaying measurement results of previous day

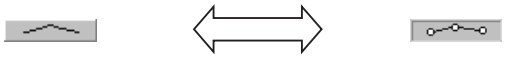
Particle size ON/OFF switch:

Set the switches for the desired particle sizes to "Draw".

Color: Serves for specifying the graph color.

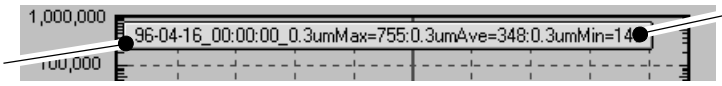
Integral: Displays the integral graph.

- **Style** Selects the graph line type.



- **Readout** Allows using the mouse to read the values for any point.

Clicking here while holding down the Ctrl key returns to the initial position.

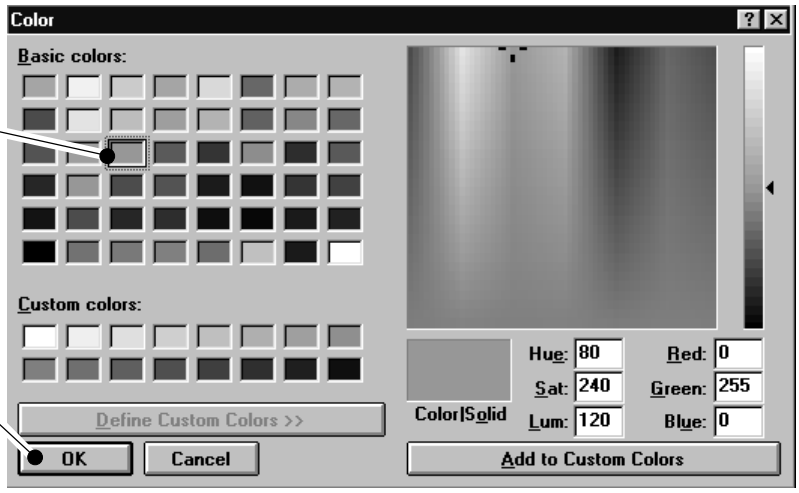


Readout display
Use the mouse (or arrow keys) to specify the desired point and read the measurement values. The display can be dragged.

- **Color** Specifies the color for the graph.

First select a color

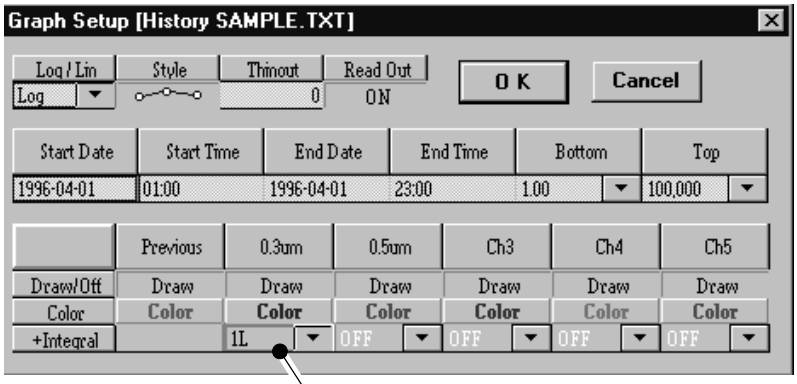
Then click on [OK]



- **Integral** Displays the integral graph.

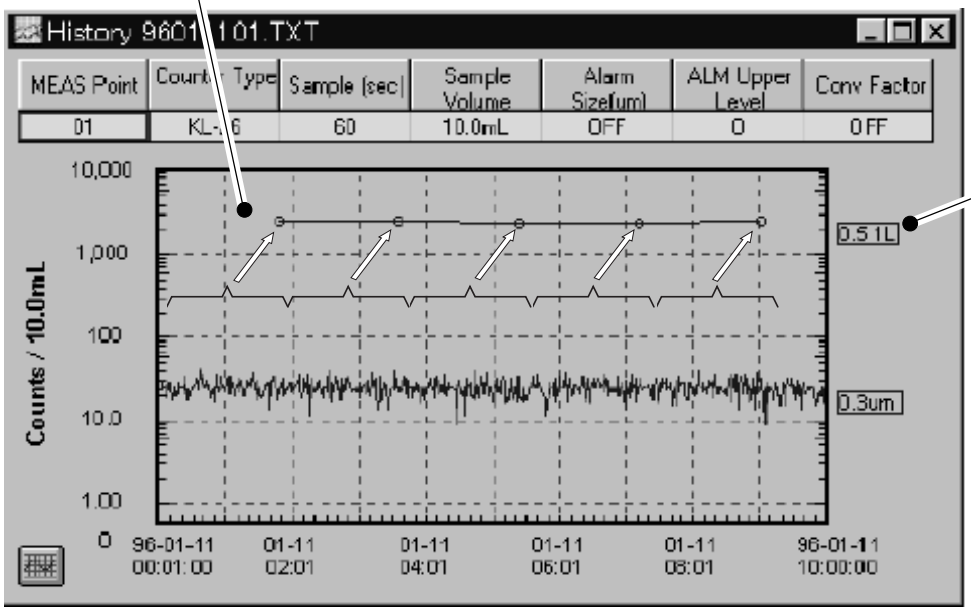
The integral graph accumulates the particle count and displays it when it reaches a certain specified quantity.

Example: graph setup



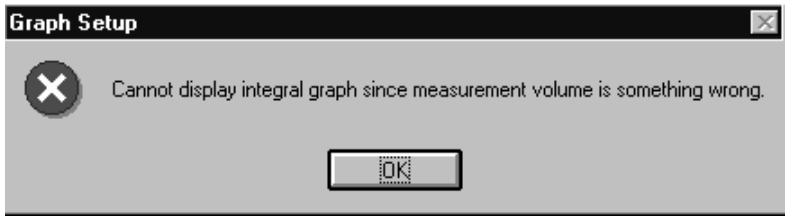
Integral volume set to 1 L (liter)

Measurements for 10 ml each are added 100 times, and result is converted to 1 liter reading



0.5 µm:1 L display

Because the measured volume is added for calculating the integral value, the sample volume must be equal to or an integer multiple of the integral volume.

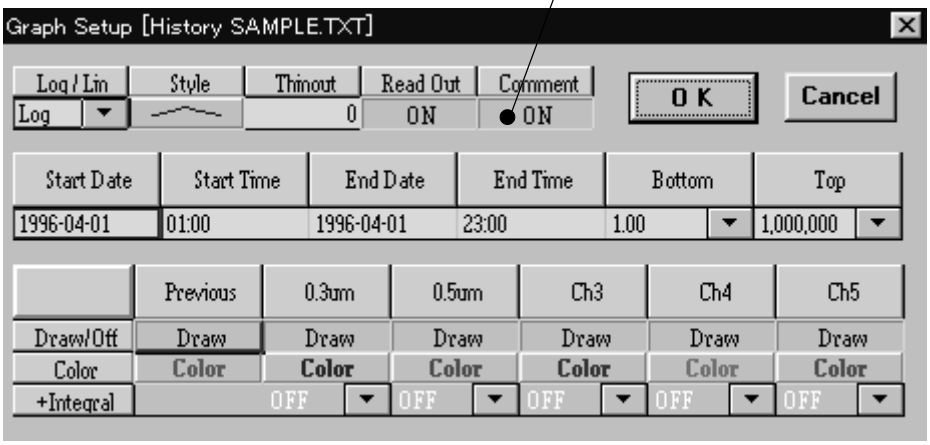


9.7 History Graph Comment Display and Printing

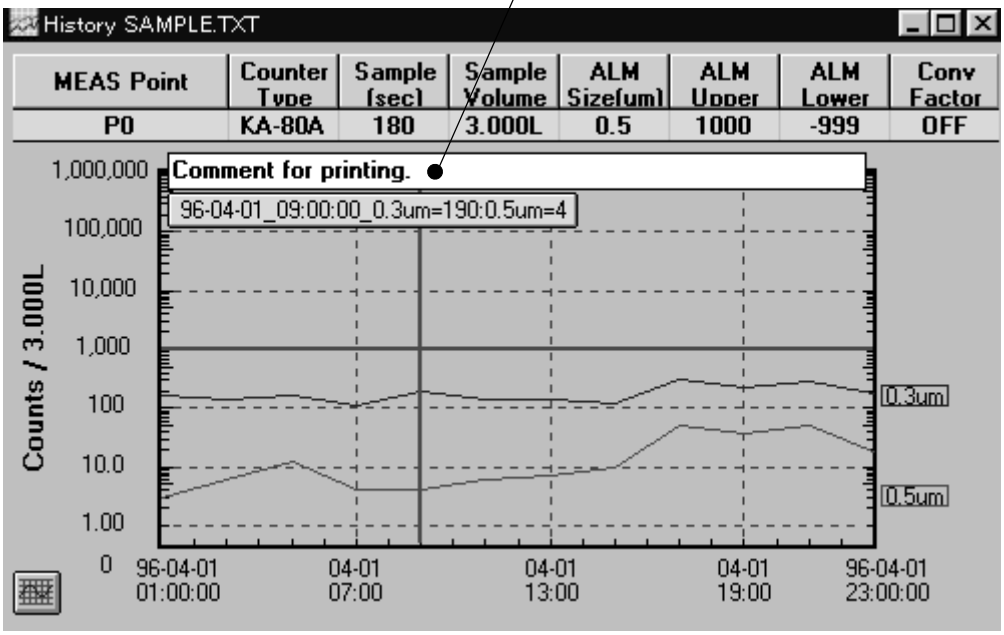
You can enter relevant information during measurement in the comment field and print out this information later.

- Information entered in the comment field is saved for each node along with other graph information. It is not saved in the measurement data file and has no effect on this file.
- Only the most recent version of the comment is saved (same comment for graph and list).
- The comment is saved when the current graph or list display is closed.
- If the comment field is not changed from the default condition ("Comment for printing"), it will not be printed.

When Comment is set to ON, the comment field is shown for the graph or list display.

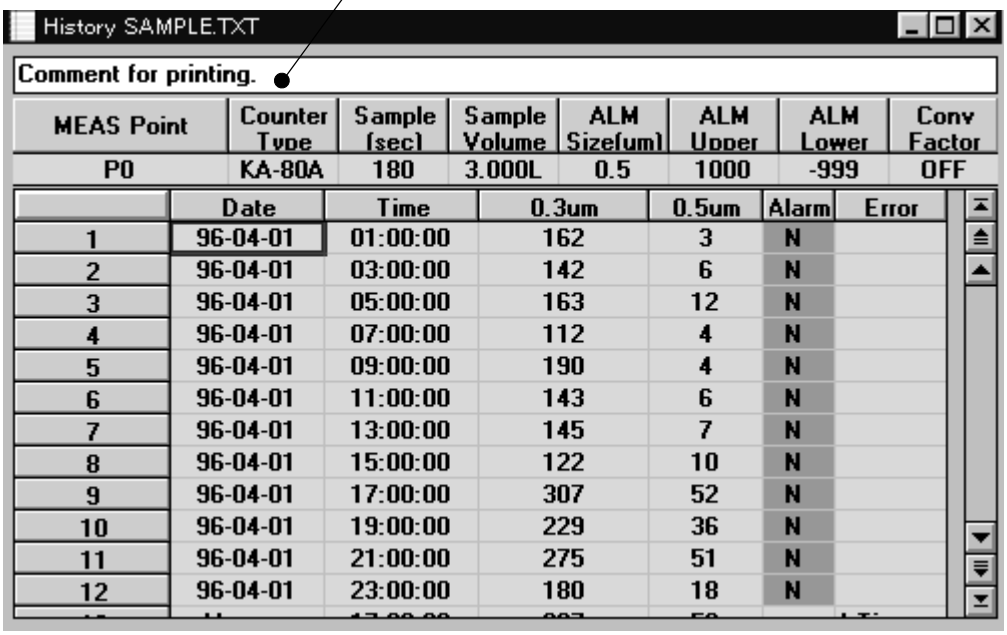


If anything is entered in the comment field, it will be printed when a hard copy is produced. You can move the comment field by dragging it.



9.8 History Numeric Comment Display and Printing

Any string entered here will be printed.



History SAMPLE.TXT

Comment for printing.

MEAS Point	Counter Type	Sample (sec)	Sample Volume	ALM Size(um)	ALM Upper	ALM Lower	Conv Factor
P0	KA-80A	180	3.000L	0.5	1000	-999	OFF

	Date	Time	0.3um	0.5um	Alarm	Error
1	96-04-01	01:00:00	162	3	N	
2	96-04-01	03:00:00	142	6	N	
3	96-04-01	05:00:00	163	12	N	
4	96-04-01	07:00:00	112	4	N	
5	96-04-01	09:00:00	190	4	N	
6	96-04-01	11:00:00	143	6	N	
7	96-04-01	13:00:00	145	7	N	
8	96-04-01	15:00:00	122	10	N	
9	96-04-01	17:00:00	307	52	N	
10	96-04-01	19:00:00	229	36	N	
11	96-04-01	21:00:00	275	51	N	
12	96-04-01	23:00:00	180	18	N	

Print example

String entered

History Numeric (Total) **c:\RP_MONI\DATA\000110P1.TXT**

Comment ABC

MEAS Point	Counter Type	Sample (sec)	Sample Vol	Alarm Size	Upper Level	Lower Level	Conv Factor
P1	KA-80B	60	1.000L	0.3	-999	100000	OFF

Date	Time	0.3um	0.5um	Alarm	Error
00-01-10	17:05:00	121862	11935	Y	
00-01-10	17:07:00	142673	14436	Y	

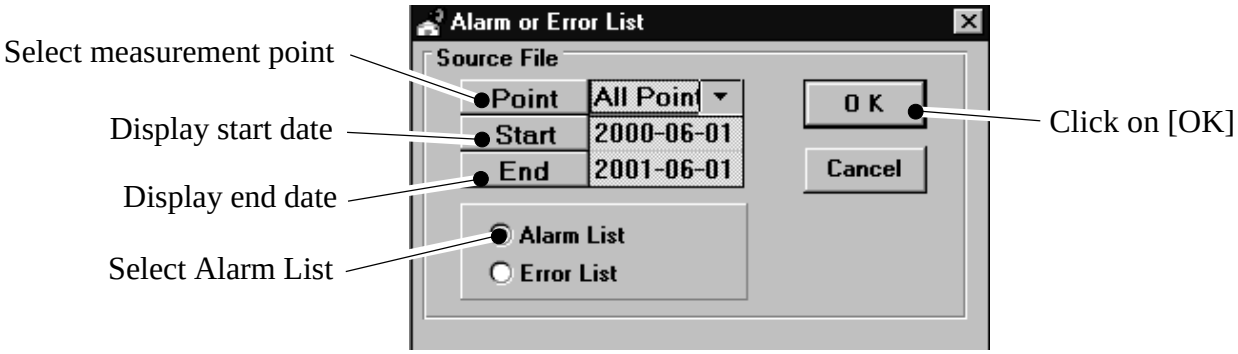
9.9 Alarm or Error List Window

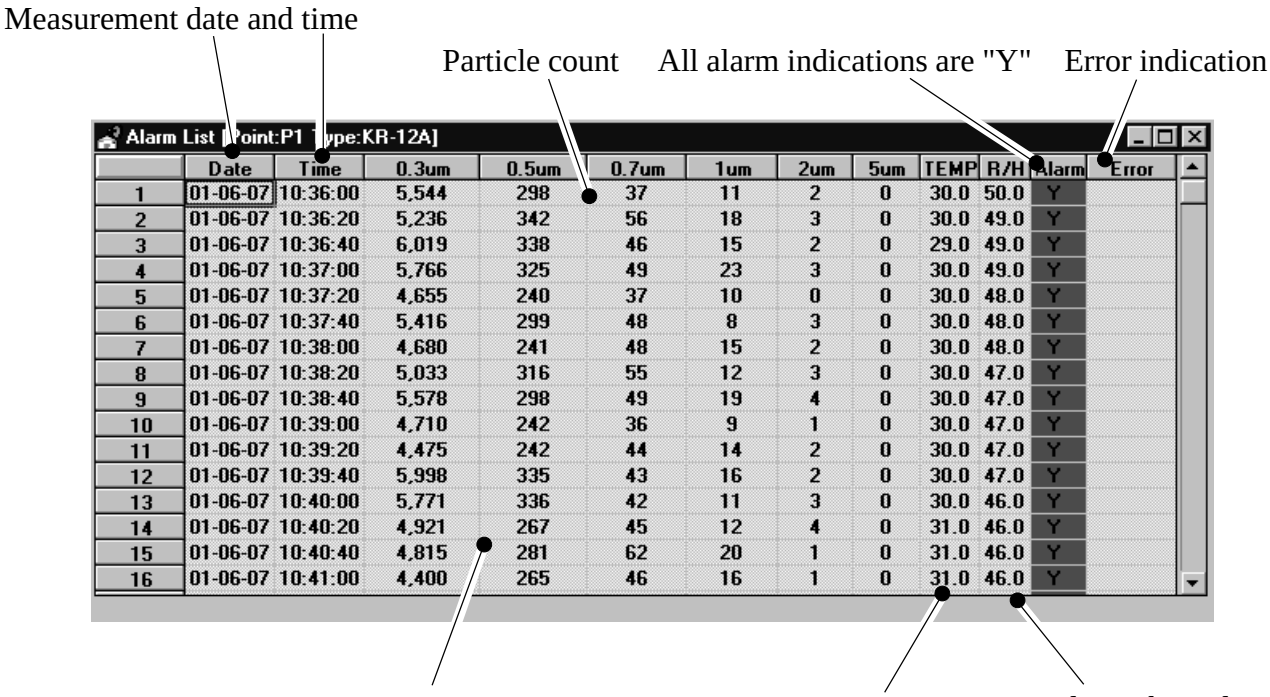
Toolbar

(1) Alarm List Window

[View] → [Alarm or Error List]

The window below appears. After selecting "Alarm List", select the measurement point and date and click on the [OK] button. The "Alarm = Y" measurements will be displayed.





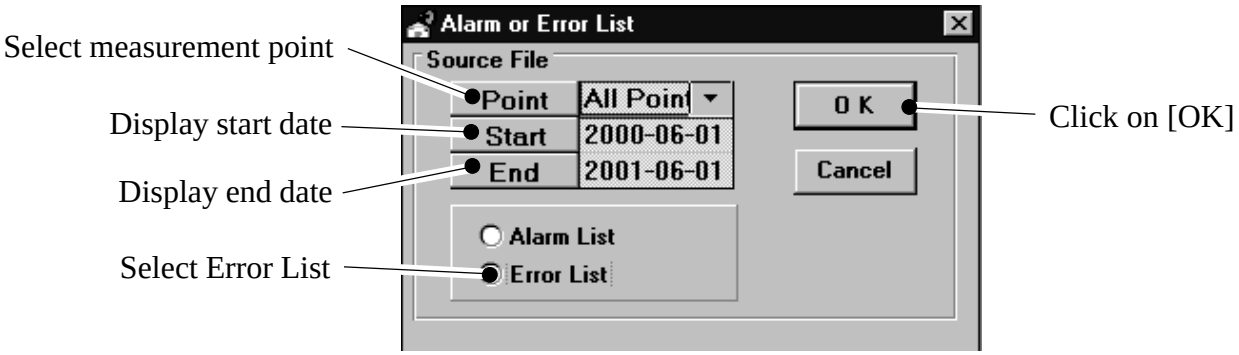
	Date	Time	0.3um	0.5um	0.7um	1um	2um	5um	TEMP	R/H	Alarm	Error
1	01-06-07	10:36:00	5,544	298	37	11	2	0	30.0	50.0	Y	
2	01-06-07	10:36:20	5,236	342	56	18	3	0	30.0	49.0	Y	
3	01-06-07	10:36:40	6,019	338	46	15	2	0	29.0	49.0	Y	
4	01-06-07	10:37:00	5,766	325	49	23	3	0	30.0	49.0	Y	
5	01-06-07	10:37:20	4,655	240	37	10	0	0	30.0	48.0	Y	
6	01-06-07	10:37:40	5,416	299	48	8	3	0	30.0	48.0	Y	
7	01-06-07	10:38:00	4,680	241	48	15	2	0	30.0	48.0	Y	
8	01-06-07	10:38:20	5,033	316	55	12	3	0	30.0	47.0	Y	
9	01-06-07	10:38:40	5,578	298	49	19	4	0	30.0	47.0	Y	
10	01-06-07	10:39:00	4,710	242	36	9	1	0	30.0	47.0	Y	
11	01-06-07	10:39:20	4,475	242	44	14	2	0	30.0	47.0	Y	
12	01-06-07	10:39:40	5,998	335	43	16	2	0	30.0	47.0	Y	
13	01-06-07	10:40:00	5,771	336	42	11	3	0	30.0	46.0	Y	
14	01-06-07	10:40:20	4,921	267	45	12	4	0	31.0	46.0	Y	
15	01-06-07	10:40:40	4,815	281	62	20	1	0	31.0	46.0	Y	
16	01-06-07	10:41:00	4,400	265	46	16	1	0	31.0	46.0	Y	

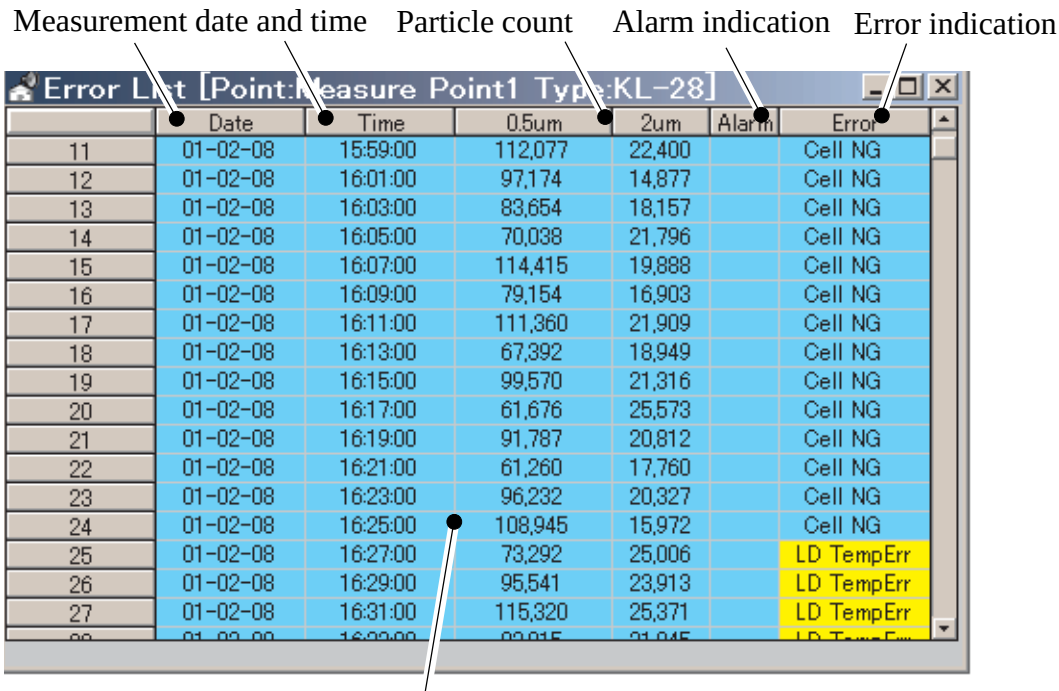
- The maximum number of lines that can be displayed by the alarm list is 1000.

(2) Error List Window

[View] → [Alarm or Error List]

The window below appears. After selecting "Error List", select the measurement point and date and click on the [OK] button. The measurements where an error has occurred will be displayed.



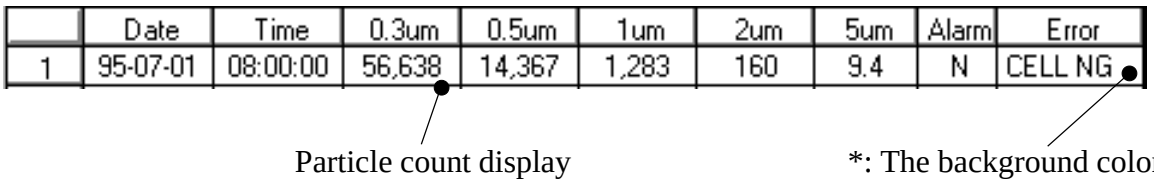


Right-clicking inside the window toggles the background color between blue and white.

- The maximum number of lines that can be displayed by the error list is 1000.

9.10 Error Messages in Error Column and Countermeasures

If an error message is shown in the error column, but the background color* does not change (remains blue), the measurement count display shows the effective count as received from the particle counter. This kind of error is called a "non-fatal error" in RP Monitor.



If an error message is shown and the background color has changed to yellow, the count indication is invalid. Such an error is called a "measurement data invalid error". (The count indication reads "0" but this is not necessarily the actual count.)

Measurement data where a "non-fatal error" has occurred are still included in alarm comparison and processing of measurement results. Measurement data where a "measurement data invalid error" has occurred are not used for alarm comparison and are excluded from processing.

Measurement data invalid errors

Power OFF: There is no response from particle counter. Particle counter will be excluded from control.
At the next Start Time (00:00:00), response check is carried out once more. Using [Restart], the particle counter only can be started for measurement.

Countermeasure: Check particle counter connection and power status.

Countermeasure: Connect UM-330 correctly and check communications parameter setup.

Timeout Err: Communications error. No measurement data are being sent from particle counter.

Countermeasure: Check particle counter connection and power status.

NAK Err or NAK=xxx (ER3 etc.):

Particle counter response problem.

Particle counter cannot execute a command for some reason.

Countermeasure: If xxx is a code (such as ER3), refer to interface section in particle counter documentation.

Example: If syringe sampler is used but measurement start timing is inappropriate, NAK=ER3 will be returned.

Example: If light source of KE-28 does not work properly, NAK=R/ER3 will be returned.

RD Timeout: Communications error. No response from particle counter.

Countermeasure: Check particle counter connection and power status.

Countermeasure: Check whether COM port number setting is correct.

CS OFF Err: Communications error. RS-232C interface is not active, or RS-485 multi-bus send/receive control does not work.

Countermeasure: Check particle counter connection and power status.

Countermeasure: Use proper RS-232C cable.

Chksum Err: Communications error. Characters have become corrupted due to noise or other factors.

Countermeasure: Install unit in an environment that is as noise-free as possible.

Not Start: Measurement could not be started at preset time.

Countermeasure: Do not use other applications on the computer during measurement.

330ER=x: Communications error. An error has occurred during communication with UM-330.

Countermeasure: Check connections and UM-330 parameter setup.

ADErrorD1: An error (D0001) has occurred in A/D converter of UM-330 input.

Countermeasure: UM-330 is defective. Contact service representative.

PVErr=x: A PV error (D0002) has occurred at UM-330.

Countermeasure: UM-330 is defective. Contact service representative.

BurnOutErr: Sensor connection cable for UM-330 is interrupted. (When using 1 to 5 V range, voltage has fallen below 1 V.)

Error E1: Error has occurred during measurement with KX-28A.

Countermeasure: Refer to documentation of particle counter.

Counter Err: Received data contained a command indicating an error (RS-232C Mode).

Countermeasure: Refer to documentation of particle counter. (KL-20 "P" or "E" is shown.)

CounterALM: Particle counter measurement error.

Countermeasure: Refer to documentation of particle counter KM-07 etc.

Alert E=2: Fatal particle counter error (Multi Mode R). Received measurement/ status data contain "E=2".

Countermeasure: Check particle counter display indication.

Error D=2,3,4...: Particle counter has sent previous measurement data (Multi Mode R). Occurs for example when particle counter ignores measurement stop command.

ErrorM=0: Particle counter could not carry out measurement (Multi Mode R). Occurs for example when particle counter ignores measurement start command.

Cal Err: Auto calibration of particle counter has failed.

Countermeasure: Refer to documentation of particle counter.

CAL NG: Auto calibration of particle counter has failed.

Countermeasure: Refer to documentation of particle counter.

LD NG: Particle counter laser diode is defective. Measurement could not be carried out.

Countermeasure: Refer to documentation of particle counter.

LASER NG: Particle counter laser diode is defective. Measurement could not be carried out.

Countermeasure: Refer to documentation of particle counter.

LD PowerErr: Particle counter laser diode output is below prescribed level (RS-232C Mode).

Countermeasure: Refer to documentation of particle counter.

LD TempErr: Particle counter laser diode temperature is not within prescribed range (RS-232C Mode).

Countermeasure: Refer to documentation of particle counter.

Over Range: The count of the particle counter has exceeded the effective number of digits for measurement data. The particle counter KM-07 etc. has a display range of 7 digits, but data received via the RS-232C interface can only have a maximum of 6 digits. Therefore RP Monitor can only display count values up to 999999. When this is exceeded, the "Over Range" error occurs.

Alternatively, in a measurement using UM-330, the sensor voltage has exceeded the measurement range.

Under Range: In a measurement using UM-330, the sensor voltage has fallen below the measurement range.

Non-fatal errors

Correction:

Measurement could not be carried out in specified measurement time (Sample Time). Particle count was time-converted according to following formula:

Count = measurement count * sampling time (seconds) / actual measurement time (seconds)

Countermeasure: Do not use other applications on the computer during measurement.

WarningE=1: A problem has occurred at the particle counter (Multi Mode R). The received status/measurement data contained the message "E=1".

Countermeasure: Check particle counter display indication.

RD Retry=1,2,3...: Noise during data communication has forced a retry, but correct measurement data could be received.

Cell NG: Contamination or condensation etc. has occurred in particle counter detector cell, preventing correct measurement.

Countermeasure: Refer to documentation of particle counter.

WARNING(CA: An error has occurred during auto calibration of particle counter.

Countermeasure: Refer to documentation of particle counter KA-81 etc.

Because RP Monitor can display only up to 10 characters in the error field, the message "WARNING(CAL)" is truncated to "WARNING(CA".

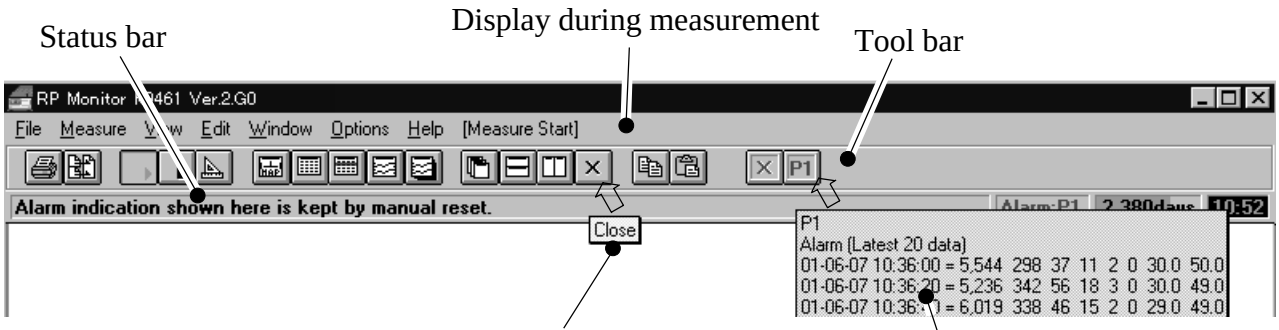
Low Batt: Internal battery of particle counter is exhausted.

Countermeasure: Refer to documentation of particle counter KM-07 etc.

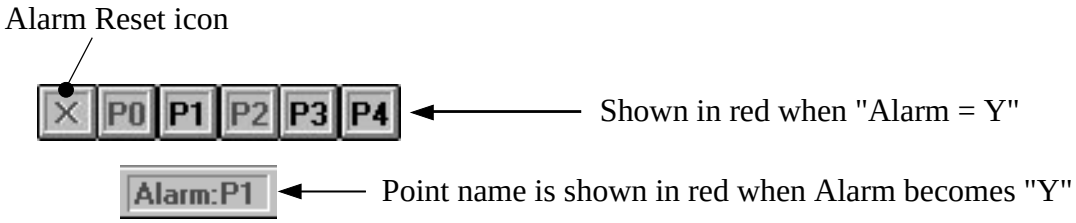
Make a note of the characters that appear in place of xxx.

9.11 Tool Bar and Status Bar Contents

The tool bar and status bar show various information items, as explained below.

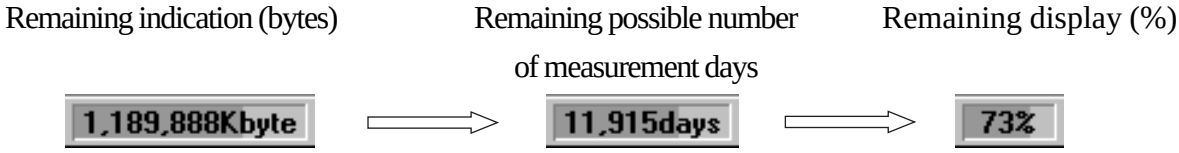


Alarm list display



Allows checking alarm nodes also without opening the real-time window.
After the list has been called up, the display will remain also when the point changes to "Alarm = N". This allows checking past alarm conditions.
To reset the alarm list display, click on the reset icon. If the alarm sound is being output, this will temporarily cancel it.

Data file remaining indication



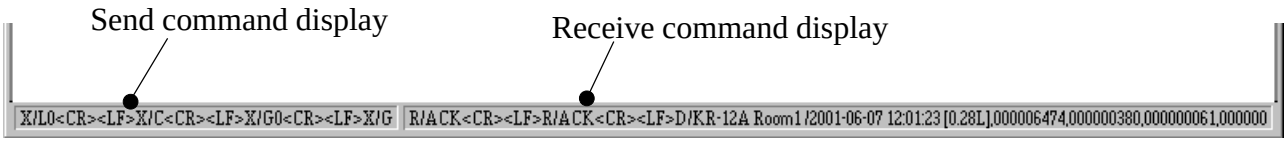
With each click, the format changes as shown above. When the number of remaining measurement days falls below 30, the display color changes to red (RS-232C, Multi Mode).
Calculation of remaining measurement days is based on the assumption that communication history is not recorded.

Date and time indication

With each click, the format changes as shown above.

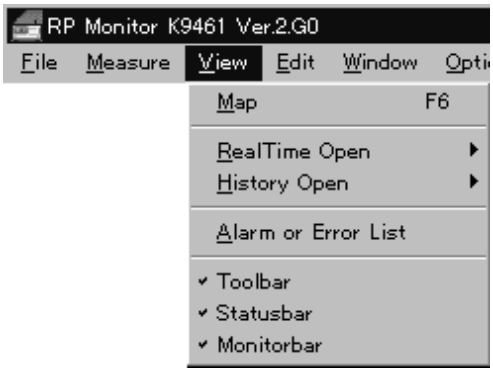
Monitorbar

The monitor bar shows the RS-232C communication status of particle counter commands.



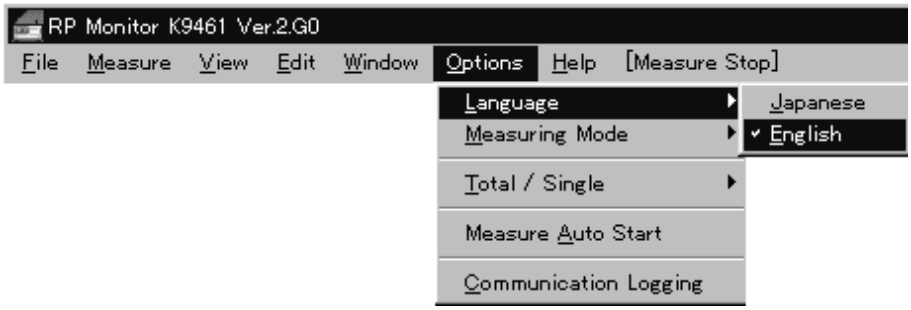
Display on/off

To turn the respective display off, remove the check mark from "Tool Barr", "Status Bar" or "Monitor Bar" in the menu.



9.12 Language Selection

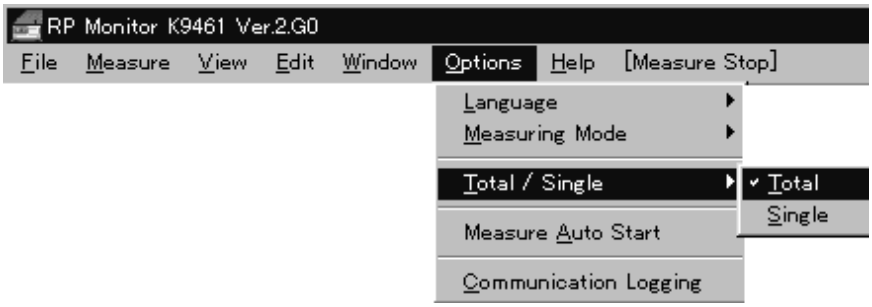
[Options] → [Language] → [Japanese]
or [Options] → [Language] → [English]



This software can display messages either in Japanese or in English. Click on the desired language. Depending on the operating system (Windows), not all messages may be in the specified language.

9.13 Single/Total Switching

[Options] → [Total/Single]



This selection determines whether RP Monitor shows measurement results as single values or total values.

Total

Total count of all particles exceeding threshold size in current channel

Single

Total particle count in next higher channel is subtracted from total particle count in current channel.

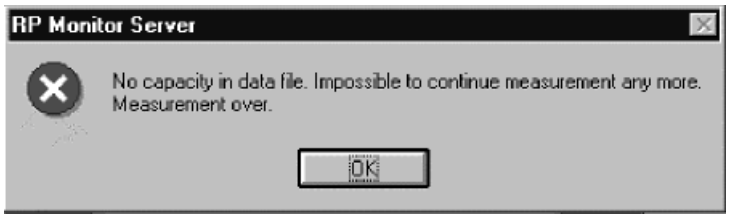
CH (example)	Total value	Single value
0.3um	Count of particles 0.3 µm and higher	Particle count from 0.3 to 0.5 µm
0.5um	Count of particles 0.5 µm and higher	Particle count from 0.5 to 1
1um	Count of particles 1 µm and higher	Particle count from 1 to 2
2um	Count of particles 2 µm and higher	Particle count from 2 to 5
5um	Count of particles 5 µm and higher	– – – – – – – – –

9.14 Error Messages During Measurement and Countermeasures

This section explains messages that may be shown during measurement. Possible countermeasures are also explained.

Remaining data file capacity low

This message appears when the remaining capacity for the measurement data file in the specified Data Path becomes 1% or less.
Because further measurement is not possible, measurement is automatically terminated after the message was shown.



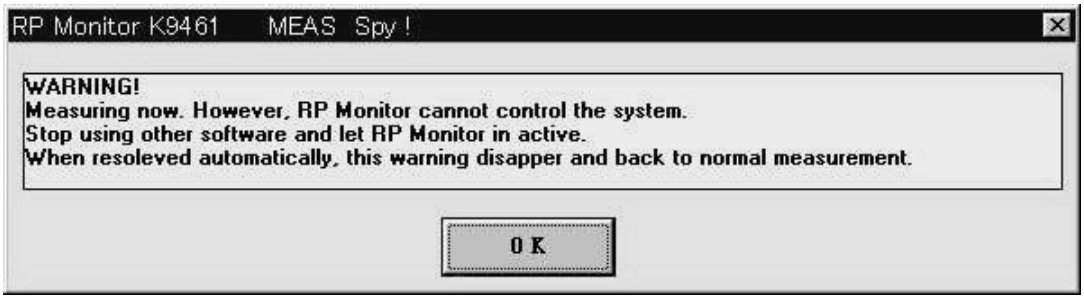
Cannot save measurement data

An error has occurred writing the file, and current measurement data cannot be written.
Remove the cause of the error as quickly as possible.
This error occurs for example when trying to import a data file for a currently ongoing measurement into Excel.
Up to 100 measurement data can be stored temporarily in the file buffer, but beyond that, measurement becomes impossible. A message will be displayed and measurement will be terminated automatically.

Measurement data cannot be output from COMx

Measurement can no longer be sent via the COM port of the computer to an alarm unit or contamination indicator panel. Check the power status and connections of related equipment.
If measurement data output should not be used, set the Output COM No. to OFF in the particle counter setup window.
Up to 100 measurement data can be stored temporarily in the file buffer. Also beyond that, continued measurement is possible and measurement will not be terminated automatically.

Warning! Measurement in progress, but measurement program does not have control.

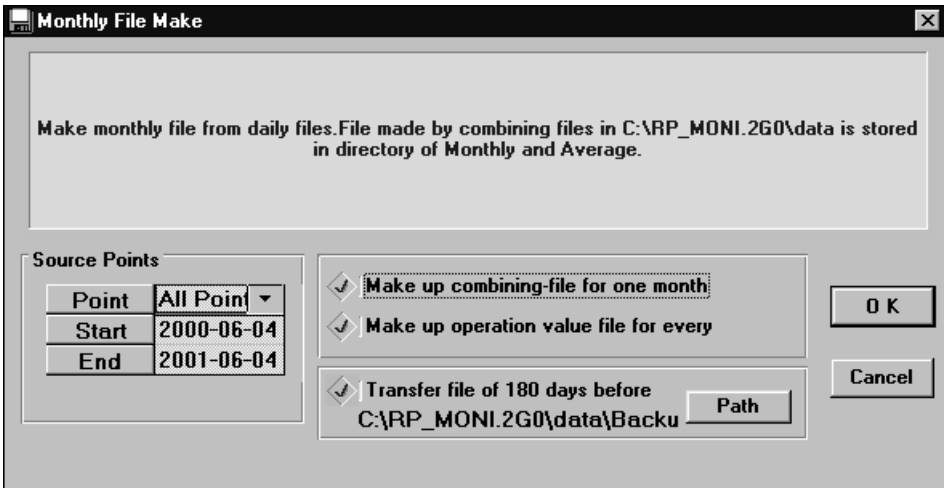


RP Monitor is not a fully multi-tasking application. If another application carries out a lengthy processing sequence, operation of RP Monitor may be interrupted, causing communication errors or other problems.
If the measurement does not respond for a long time (several seconds) during measurement (as can happen for example when a floppy disk is being formatted using File Manager), the above message will appear. In such a case, stop the other program or application. When the cause has been removed, the message disappears.
This kind of problem is more likely to occur when using a slow PC.
In some cases, the error message may not appear, even if there is a problem (for example when reading a large measurement file with RP Monitor, or when a mouse button is kept depressed for a long time during measurement).
When the measurement program was stopped and the start command could not be given although the specified start time has passed, RP Monitor will display the "Not Start" error and skip the measurement once. If measurement was stopped after the specified stop time, the "Correct error" will be generated and time-conversion is performed.

10. Creating a Monthly Report File

[File] → [Monthly File]

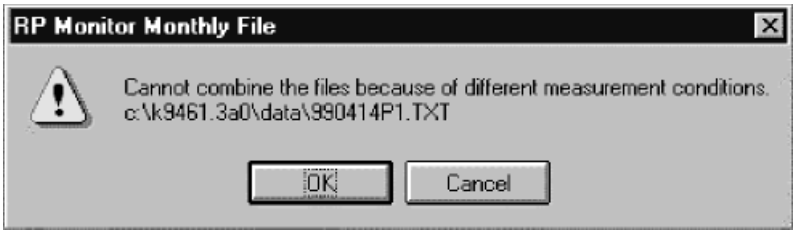
Toolbar



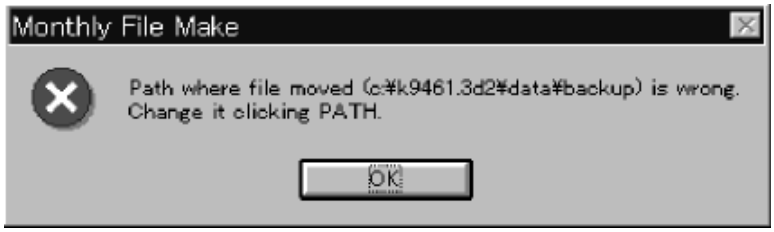
Create continuous file for one month: Link (combine) files within specified range to create monthly file.
Create monthly processing value file: Process files within specified range to create monthly processing value file.
Move files more than 180 days old: Out of specified range, move files that are more than 180 days old.
For details, see following pages.

Path: Specifies the move target folder.
Point: Select the files to link (combine). Selecting All Points includes all measurement points.
Start: Enter measurement date from which to link files.
End: Enter measurement date up to which to link files.
OK: Start operation with above settings.
Cancel: Cancel operation and return to previous screen.

If measurement parameters were changed midway, the following message appears. When you click on [OK], the displayed file is not linked, but the operation continues with the next file. Clicking on [Cancel] aborts the operation.



If there is a problem with the target folder (folder does not exist), the following message appears. Click on Path and change the target folder.



10.1 Linked Monthly File

To create the file, check the following box.

In modes other than memory receive, RP Monitor creates a file for each measurement point and each day. These files can be linked to form a monthly file. The last lines of the file contain the maximum, average, and minimum values for the month.

Daily measurement data file
010101P1.txt
Daily measurement data file
010102P1.txt
Daily measurement data file
010102P1.txt
Daily measurement data file
010102P1.txt

Monthly linked file

Monthly\0101__P1.txt

File name for linked file containing data from 2001/01/01 to 2001/01/31 is
yymm__P1.txt

Daily measurement data are collected in a single file.

The monthly measurement data file created using the KM memory receive mode originally does not contain the maximum, average, and minimum values for the month, but the values can be included by performing the following operation.

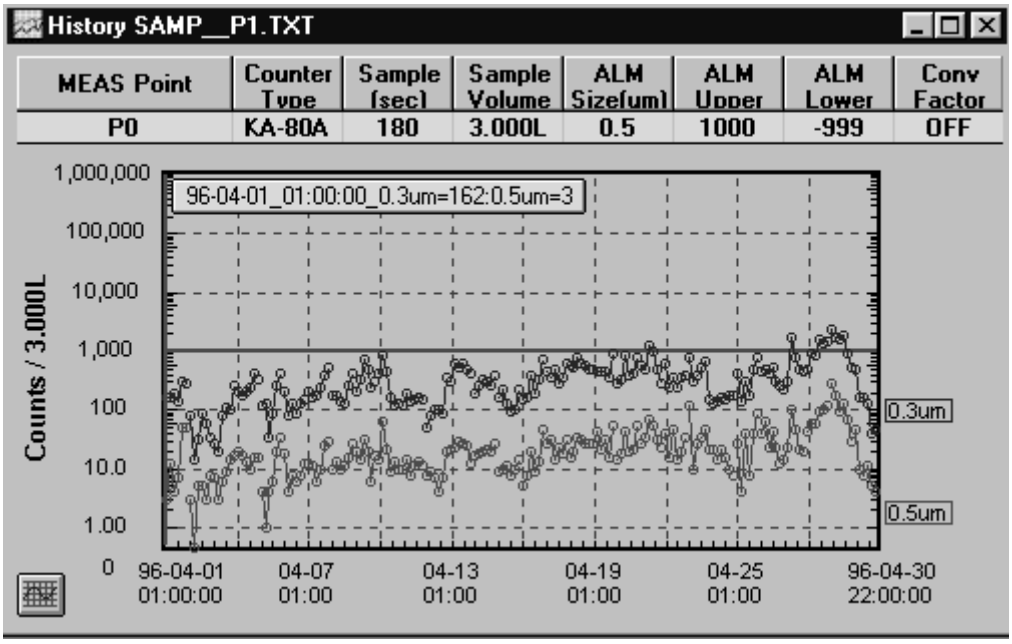
Monthly measurement data file
0101KMP1.txt

Monthly\0101__P1.txt
Maximum, average, and minimum values for period from 2001/01/01 to 2001/01/31 are calculated and included in the file.
The file name is
yymm__P1.txt

- Other information

If a linked file with the same name already exists, that file will be deleted and the file for the newly specified range will be created.

As an example, see the file Samp_p1.txt located in the folder RP_MONI.xxx\Data\Monthly. The linked file can be displayed as a history graph for one month.



10.2 Processing Value Monthly File

To create the file, check the following box.

In modes other than KM memory receive mode, RP Monitor creates a file for each measurement point and each day. Data from these files can be used to create a monthly processing value file at each measurement channel. The last lines of the file contain the maximum, average, and minimum values for the month.

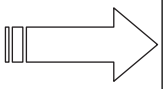
Monthly processing value file

Daily measurement data file
010101P1.txt

Daily measurement data file
010102P1.txt

Daily measurement data file
010102P1.txt

Daily measurement data file
010102P1.txt



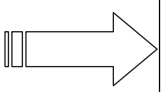
Average\0101C1P1.txt

File name for file containing processed data from 2001/01/01 to 2001/01/31 is
yymmC1P1.txt for channel 1
yymmC2P1.txt for channel 2
C1 is the measurement channel 1 (example: 0.3 um) and C2 is the measurement channel 2 (example: 0.5 um).

Daily measurement data are represented as one line in the file.

The monthly measurement data file created using the KM memory receive mode can also be used to create a monthly processing value file. The last lines of the file contain the maximum, average, and minimum values for the month.

Monthly measurement data file
0101KMP1.txt



Average\0101C1P1.txt

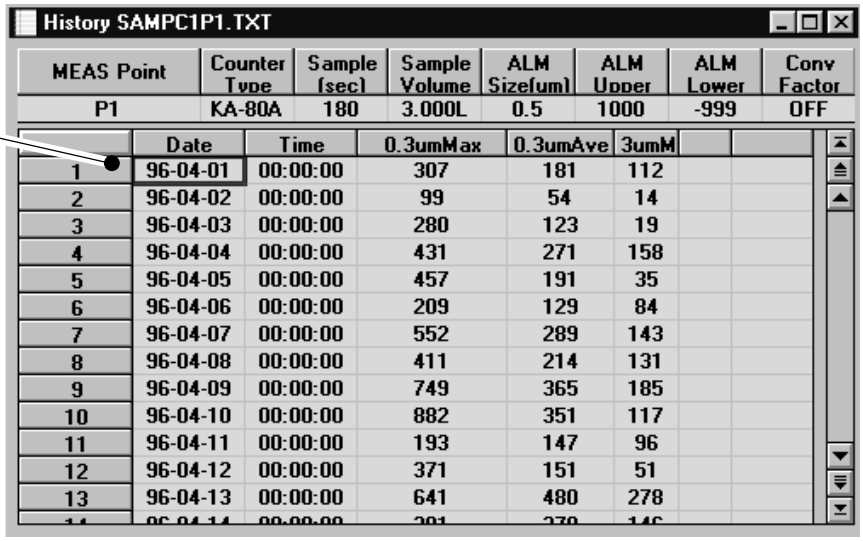
File name for file containing processed data from 2001/01/01 to 2001/01/31 is
yymmC1P1.txt for channel 1
yymmC2P1.txt for channel 2
C1 is the measurement channel 1 (example: 0.3 um) and C2 is the measurement channel 2 (example: 0.5 um).

- Other information

  If a processing value file already exists in the same file name, that file will be deleted and the file for the newly specified range will be created.

  As an example, see the file Sampc1p1.txt located in the folder RP_MONI.xxx\Data\Average.

Measurement data for one day are given as one line in the file.



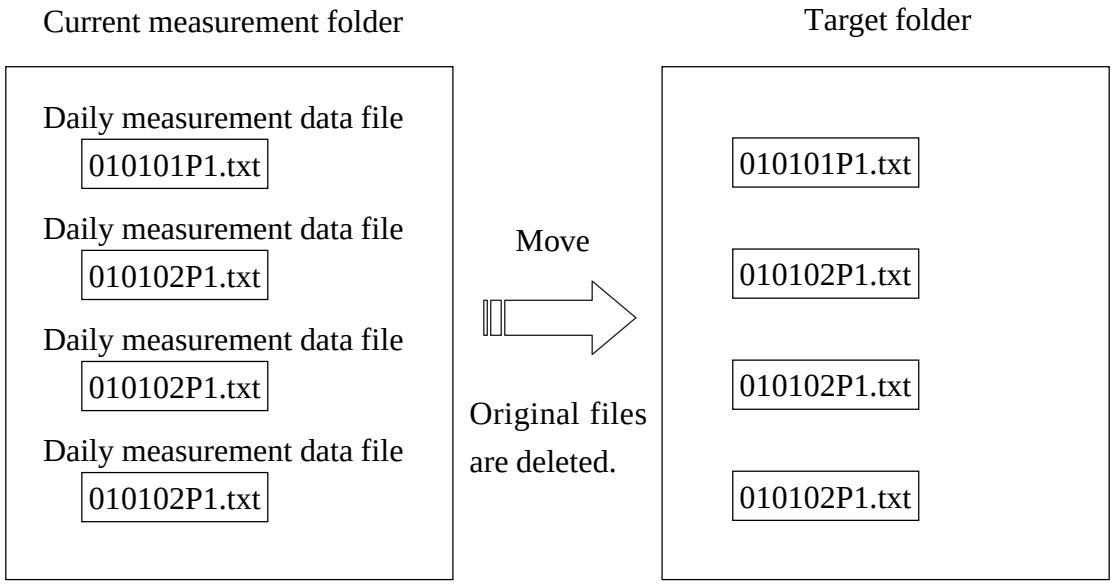
History SAMPC1P1.TXT

MEAS Point	Counter Type	Sample (sec)	Sample Volume	ALM Size(um)	ALM Upper	ALM Lower	Conv Factor
P1	KA-80A	180	3.000L	0.5	1000	-999	OFF

	Date	Time	0.3umMax	0.3umAve	3umM
1	96-04-01	00:00:00	307	181	112
2	96-04-02	00:00:00	99	54	14
3	96-04-03	00:00:00	280	123	19
4	96-04-04	00:00:00	431	271	158
5	96-04-05	00:00:00	457	191	35
6	96-04-06	00:00:00	209	129	84
7	96-04-07	00:00:00	552	289	143
8	96-04-08	00:00:00	411	214	131
9	96-04-09	00:00:00	749	365	185
10	96-04-10	00:00:00	882	351	117
11	96-04-11	00:00:00	193	147	96
12	96-04-12	00:00:00	371	151	51
13	96-04-13	00:00:00	641	480	278

10.3 Moving Files More than 180 Days Old

After some time of using this system, a considerable number of files will accumulate. This makes it more time consuming to select a file and can reduce processing speed. Therefore files more than 180 days old should be moved to a separate folder.



By specifying an external file system or separate computer as the target folder, this function can be used for backing up measurement data files.

11. Print Menu

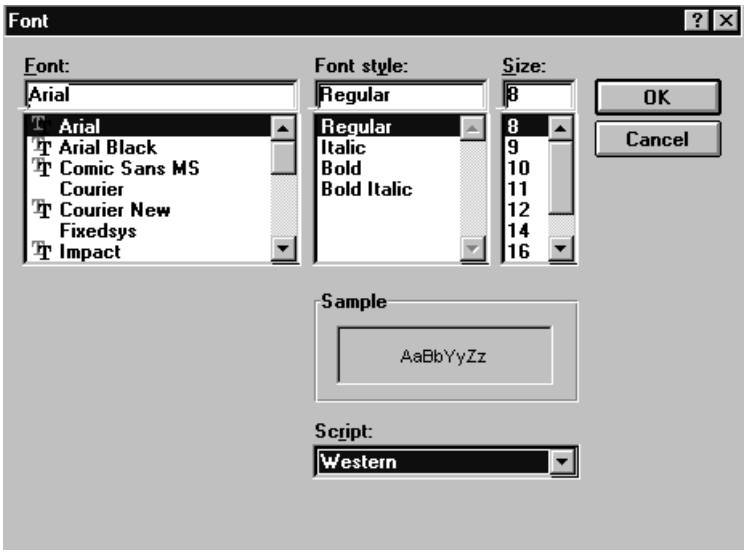
When starting to use Windows for the first time, it is necessary to install the correct printer driver and perform setup.

11.1 Display Font

[File] → [Font]

The font used in most RP Monitor windows can be set here.

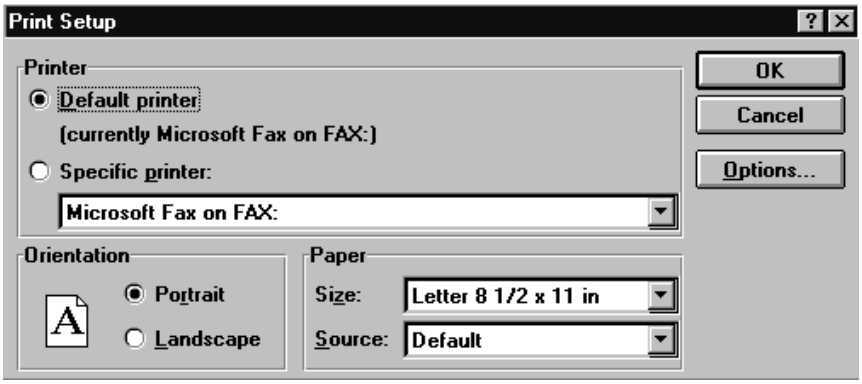
To display Japanese, select a Japanese font.



11.2 Printer Setup

[File] → [Print] → [Settings]

The dialog box shown below appears. Select the printer model, print orientation, and paper size. The setting for default printer will apply to RP Monitor and other applications. If the printer you wish to use is not on the list, you will need to install a printer driver supplied by the printer manufacturer.

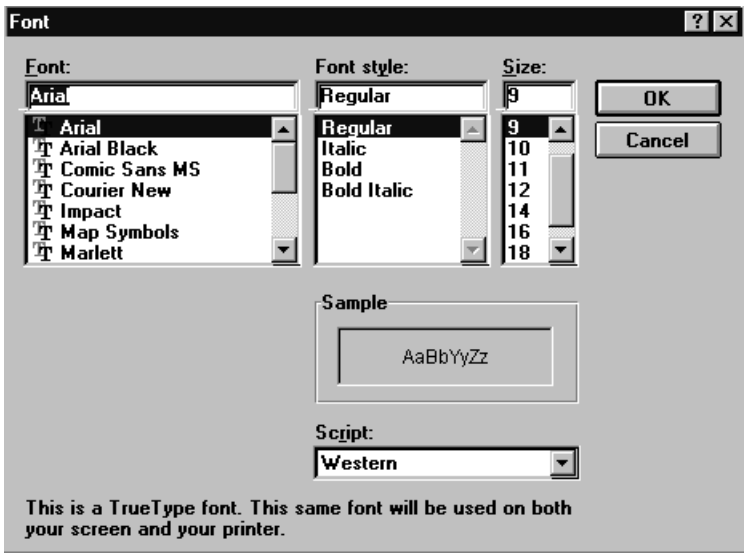


11.3 Printer Fonts

[File] → [Print] → [Font]

This setting selects which font, style, and point size to use for printing. When using a small paper size, you should select an appropriate font size to ensure that the entire contents will fit on the page.

The font selection made here has no effect on graph printing.



11.4 Print

Toolbar 

[1] Click on any part of the window you want to print, to make the window active.

[2] Call up the [Print] menu and select printing.

11.5 Print Samples

- Particle counter setup print sample

  Since the data are wide, choose a small font or use the paper in landscape mode.

Particle Counter Setup [RS232C Mode] Ver3.F0 2001/02/13 18:01:00

COM No.	MEAS Point	File Name	MEAS ON/OFF	Counter Type	Start Time	Stop Time	Sample (sec)	Sample Vol	Period (sec)	Alarm Size	Alarm Lower	Alarm Upper	Conv Factor	Ave Times	Dispens Times	MEAS Times	Cycle Time(m)	Syringe Mode	Standby Mode
COM1	MP1	P1	ON	KC-03	00:00	00:00	60	2.83L	120	0.3	-999	100000	OFF	1	0	-1	-1	OFF	ON
COM2	MP2	P2	ON	KC-90	00:00	00:00	10	----	20	OFF	-999	100	OFF	1	0	-1	-1	OFF	ON
COM3	MP3	P3	ON	KL-28	00:00	00:00	60	10mL	20	OFF	-999	100	OFF	1	0	-1	-1	OFF	ON

- History numeric print sample

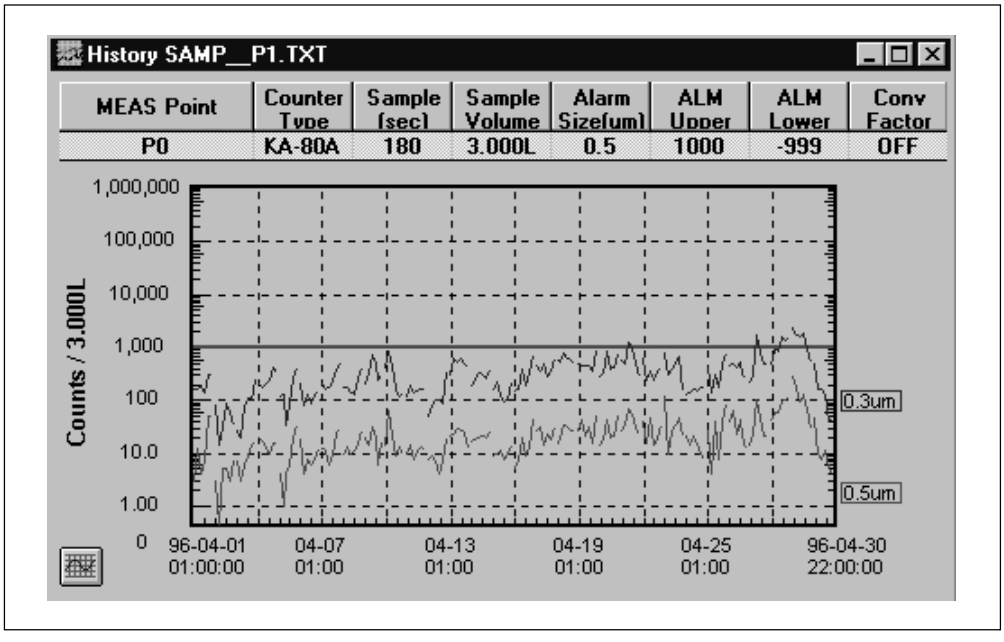
History Numeric (Total) c:\RP_MONI\DATA\000110P1.TXT

MEAS Point	Counter Type	Sample (sec)	Sample Vol	Alarm Size	Upper Level	Lower Level	Conv Factor
MP1	KA-80B	60	1.000L	0.3	-999	100000	OFF

Date	Time	0.3um	0.5um	Alarm	Error
00-01-10	17:05:00	121862	11935	Y	
00-01-10	17:07:00	142673	14436	Y	
00-01-10	17:09:00	141548	15837	Y	
00-01-10	17:11:00	144943	16367	Y	
00-01-10	17:13:00	131257	14197	Y	
Max	17:11:00	144943	16367		M.Time=
Ave	-:-:-	136457	14554		5
Min	17:05:00	121862	11935		

- History graph print sample

  Because the on-screen size is preserved when printing, you can change print size by changing the window size on screen. Adjust the size of the window before printing.



11.6 Printing Monthly Report Only

[File] → [Print] → [Print] → [Monthly Print]

If a monthly file (example: Monthly/0101_P1.txt) has been read into a window using the history count display mode, only the maximum, average, and minimum values for that month will be printed. When this command is executed for any other window, the function will be the same as for the [Print] command above.

History Numeric (Total) **c:\RP_MON\DATA\MONTHLY\0102_P0.TXT**

MEAS Point	Counter Type	Sample (sec)	Sample Vol	Alarm Size	Alarm Level	Conv Factor
P0	KM-80B	60	1.000L	0.3	100000	OFF

********** Monthly Report **********

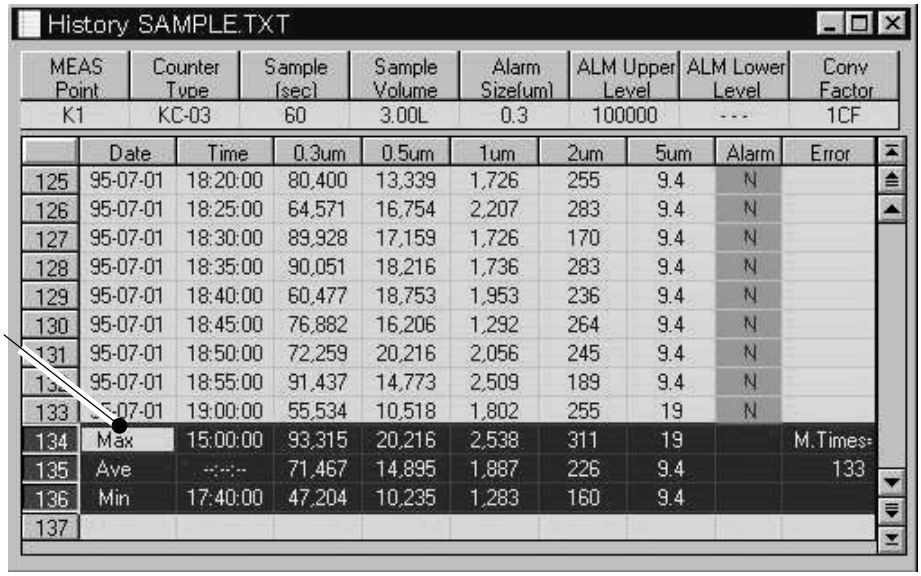
From	01-02-01	00:00:00
To	01-02-28	23:55:00
M.Time	8924	

	Date	Time	0.3um	0.5um
Max	01-02-02	18:40:00	977,981	236,053
Ave	———	–:–:–	165,442	12,958
Min	01-02-03	14:15:00	22,873	1,378

11.7 Printing a Specified Range

From the history count display and alarm/error list, the mouse can be used to specify (highlight) a range to be printed.

Specify range by dragging mouse and execute [Print] command.



MEAS Point	Counter Type	Sample (sec)	Sample Volume	Alarm Size(um)	ALM Upper Level	ALM Lower Level	Conv Factor
K1	KC-03	60	3.00L	0.3	100000	---	1CF

	Date	Time	0.3um	0.5um	1um	2um	5um	Alarm	Error
125	95-07-01	18:20:00	80,400	13,339	1,726	255	9.4	N	
126	95-07-01	18:25:00	64,571	16,754	2,207	283	9.4	N	
127	95-07-01	18:30:00	89,928	17,159	1,726	170	9.4	N	
128	95-07-01	18:35:00	90,051	18,216	1,736	283	9.4	N	
129	95-07-01	18:40:00	60,477	18,753	1,953	236	9.4	N	
130	95-07-01	18:45:00	76,882	16,206	1,292	264	9.4	N	
131	95-07-01	18:50:00	72,259	20,216	2,056	245	9.4	N	
132	95-07-01	18:55:00	91,437	14,773	2,509	189	9.4	N	
133	95-07-01	19:00:00	55,534	10,518	1,802	255	19	N	
134	Max	15:00:00	93,315	20,216	2,538	311	19		M.Times=
135	Ave	--:--:--	71,467	14,895	1,887	226	9.4		133
136	Min	17:40:00	47,204	10,235	1,283	160	9.4		
137									

Print sample

History Numeric (Total) **C:\K9461.300\DATA\SAMPLE.TXT**

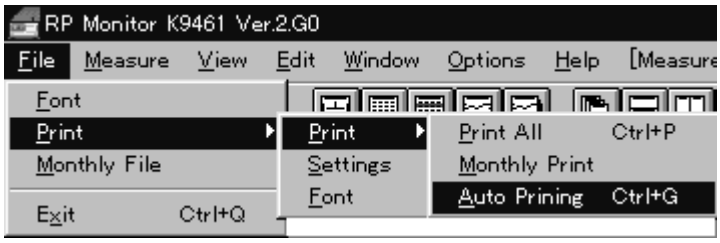
MEAS Point	Counter Type	Sample (sec)	Sample Vol	Alarm Size	Alarm Level	Conv Factor
K1	KC-03	60	3.00L	0.3	100000	1CF

Date	Time	0.3um	0.5um	1um	2um	5um	Alarm	Error
Max	15:00:00	93,315	20,216	2,538	311	19		M.Times=
Ave	—:—:—	71,467	14,895	1,887	226	9.4		133
Min	17:40:00	47,204	10,235	1,283	160	9.4		

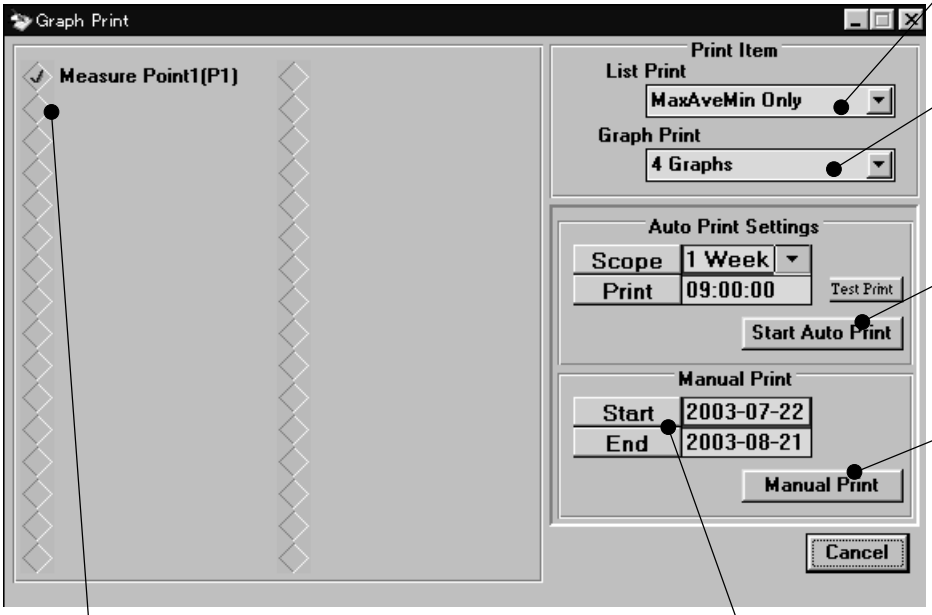
11.8 Automatic List/Graph Printing

1. From the menu, select [File] → [Print] → [Print] → [Auto Printing].

Alternatively, press the G key while holding down the Ctrl key.



2. The following window appears.



Select the list type

Select how many graphs to print per page

Activates the auto print standby condition

Starts printing manually

Select the measurement point to print

Specifies print scope for manual printing

3. Making settings

(1) First, select the measurement point to print.

(2) For list (numeric value) printing, select either "Print All List" (print all measurement data) or "Max Ave Min Only" (print only processed measurement data) from the List Print drop-down menu. When using list printing, the processed values for the specified print scope will be printed on the last line. To turn list printing off, select "Print OFF".

(3) For graph printing, select the number of graphs to print per page (1 Graph, 2 Graphs, 3 Graphs, etc.) from the Graph Print drop-down menu. To turn graph printing off, select "Print OFF".

4. Manual printing

(1) To print manually, specify the Start and End date in the Manual Print frame.

(2) Click on the Manual Print button to start printing.

5. Auto printing

(1) In the Auto Print Settings frame, select the print scope (1 Day, 1 Week, or 1 Month). When "1 Day" is selected, printing is carried out every day at a preset time (for example 9:00). When "1 Week" is selected, printing is carried out every Monday at a preset time, and when "1 Month" is selected, printing is carried out on the 1st of every month at a preset time.

(2) Specify the time when printing should be carried out. The input range is 01:00 to 23:00.

(3) The Test Print button can be used to check whether the desired contents will be printed, without having to wait until the preset Print Time. However, measurement data for printing must be present.

(4) Clicking the Start Auto Print button puts the system into standby mode for auto printing. In this condition, the window cannot be closed, and manual printing cannot be carried out.

(5) When the window is minimized to an icon, two emoticons (^o^) and (^_^) will be shown alternately, to indicate that an operation is in progress.

6. Print example

Sample printout for one week with "Max Ave Min Only" setting

** History Numeric List **

MEAS Point	Counter Type	Sample (sec)	Sample Vol	Alarm Size	Upper Level	Lower Level	Conv. Factor
P1	KA-80A	180	3.000L	OFF	0	-999	OFF

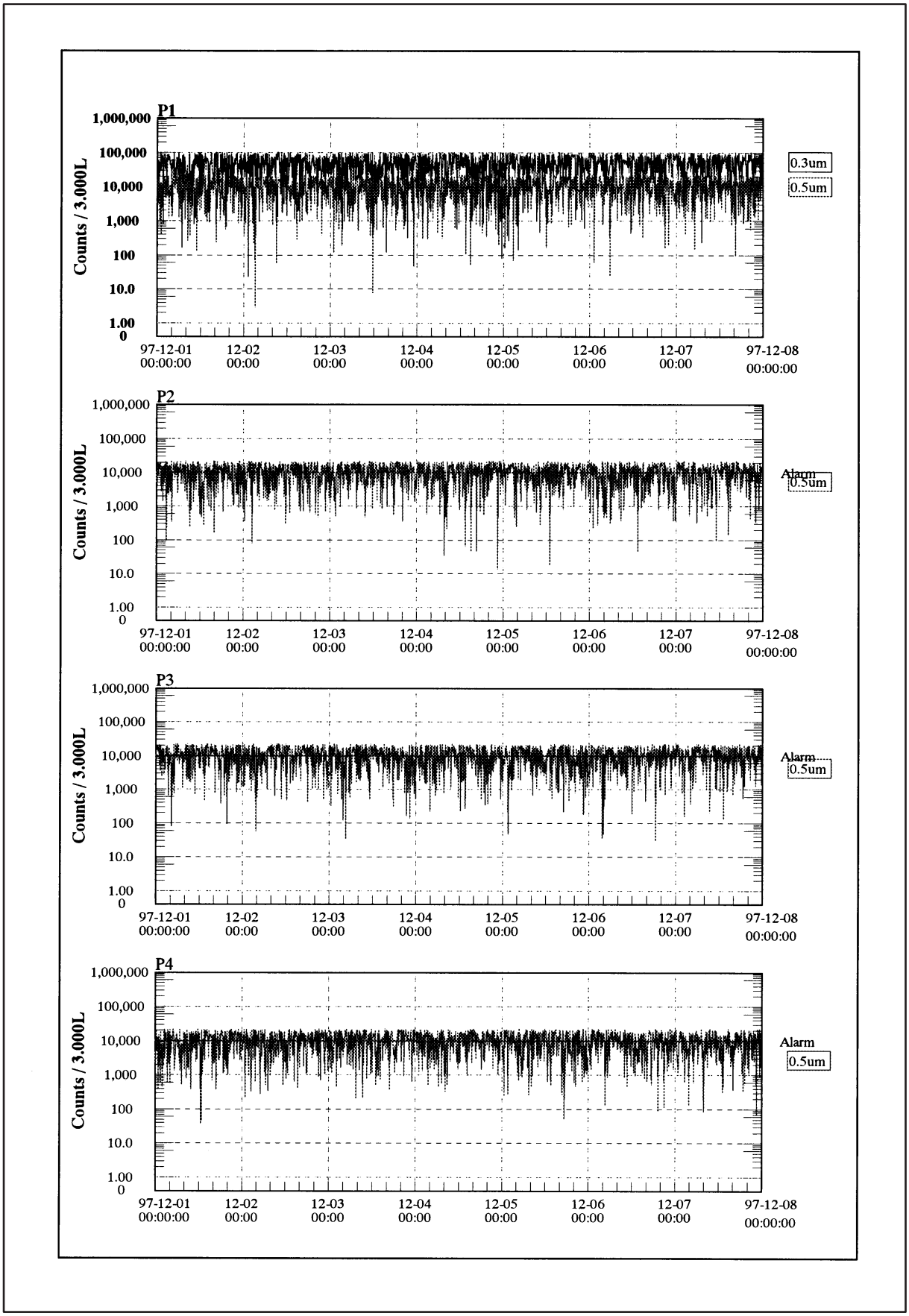
Date	Time	0.3um	0.5um	Alarm	Error
**********	Report 97-12-01	**********			
Max	16:30:00	98,485	21,551		M.Times=
Ave	--:--:--	47,460	10,612		240
Min	01:42:00	804	127		
**********	Report 97-12-02	**********			
Max	09:18:00	99,645	21,570		M.Times=
Ave	--:--:--	51,136	10,555		240
Min	02:30:00	1,039	3		
**********	Report 97-12-03	**********			
Max	11:42:00	99,871	20,916		M.Times=
Ave	--:--:--	48,998	10,320		240
Min	15:30:00	125	8		
**********	Report 97-12-04	**********			
Max	10:18:00	99,168	21,597		M.Times=
Ave	--:--:--	49,136	10,483		240
Min	23:36:00	82	53		
**********	Report 97-12-05	**********			
Max	15:30:00	99,750	21,556		M.Times=
Ave	--:--:--	52,294	10,763		240
Min	01:30:00	276	72		
**********	Report 97-12-06	**********			
Max	07:42:00	99,270	21,578		M.Times=
Ave	--:--:--	52,251	11,208		240
Min	20:42:00	2,273	25		
**********	Report 97-12-07	**********			
Max	00:48:00	99,893	21,511		M.Times=
Ave	--:--:--	51,750	11,003		239
Min	19:42:00	1,026	94		

////////////// Report 97-12-01 -> 97-12-07 ///////////////

From	97-12-01	00:00:00
To	97-12-07	23:54:00
M.Times	1679	

	Date	Time	0.3um	0.5um
Max	97-12-07	00:48:00	99,893	21,597
Ave	--------	--:--:--	50,431	10,706
Min	97-12-04	23:36:00	82	3

Sample printout for one week with "4 Graphs" setting



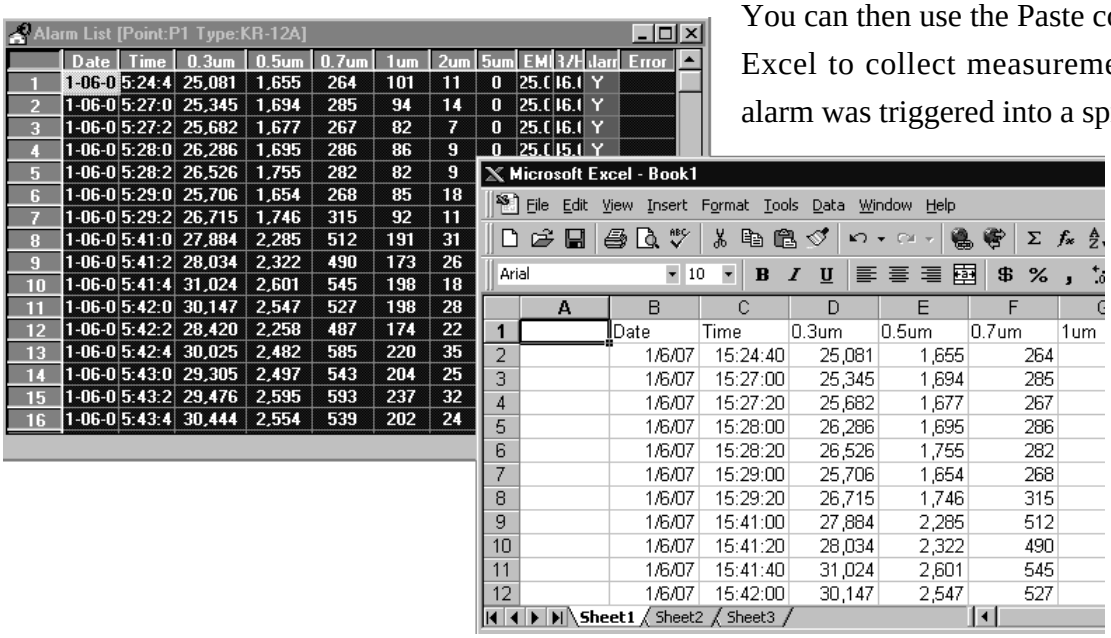
12. Edit Menu

12.1 Copy

Toolbar

Specify (highlight) a range to be copied by dragging the mouse. Then select [Edit] → [Copy] to copy the selected range to the clipboard. The contents of the clipboard can then be copied to another application.

For example, display the alarm list, highlight a range, then select [Edit] → [Copy].

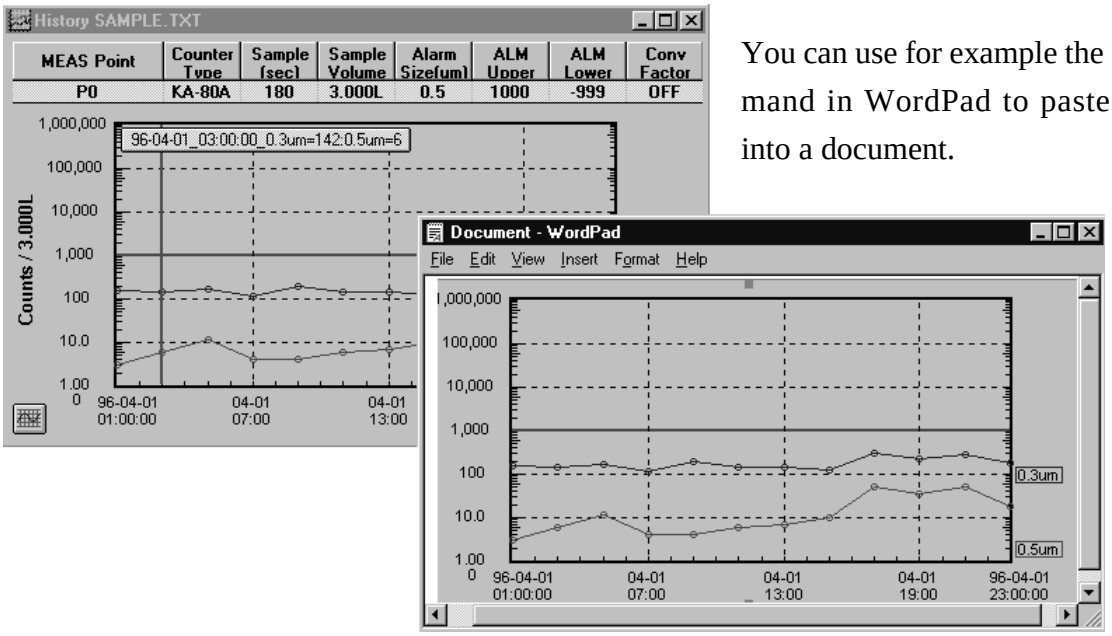


	Date	Time	0.3um	0.5um	0.7um	1um	2um	5um	EM	3/H	Alarm	Error
1	1-06-0	5:24:4	25,081	1,655	264	101	11	0	25.0	16.0	Y	
2	1-06-0	5:27:0	25,345	1,694	285	94	14	0	25.0	16.0	Y	
3	1-06-0	5:27:2	25,682	1,677	267	82	7	0	25.0	16.0	Y	
4	1-06-0	5:28:0	26,286	1,695	286	86	9	0	25.0	15.0	Y	
5	1-06-0	5:28:2	26,526	1,755	282	82	9					
6	1-06-0	5:29:0	25,706	1,654	268	85	18					
7	1-06-0	5:29:2	26,715	1,746	315	92	11					
8	1-06-0	5:41:0	27,884	2,285	512	191	31					
9	1-06-0	5:41:2	28,034	2,322	490	173	26					
10	1-06-0	5:41:4	31,024	2,601	545	198	18					
11	1-06-0	5:42:0	30,147	2,547	527	198	28					
12	1-06-0	5:42:2	28,420	2,258	487	174	22					
13	1-06-0	5:42:4	30,025	2,482	585	220	35					
14	1-06-0	5:43:0	29,305	2,497	543	204	25					
15	1-06-0	5:43:2	29,476	2,595	593	237	32					
16	1-06-0	5:43:4	30,444	2,554	539	202	24					

	A	B	C	D	E	F	G
1		Date	Time	0.3um	0.5um	0.7um	1um
2		1/6/07	15:24:40	25,081	1,655	264	
3		1/6/07	15:27:00	25,345	1,694	285	
4		1/6/07	15:27:20	25,682	1,677	267	
5		1/6/07	15:28:00	26,286	1,695	286	
6		1/6/07	15:28:20	26,526	1,755	282	
7		1/6/07	15:29:00	25,706	1,654	268	
8		1/6/07	15:29:20	26,715	1,746	315	
9		1/6/07	15:41:00	27,884	2,285	512	
10		1/6/07	15:41:20	28,034	2,322	490	
11		1/6/07	15:41:40	31,024	2,601	545	
12		1/6/07	15:42:00	30,147	2,547	527	

You can then use the Paste command in Excel to collect measurements where alarm was triggered into a spreadsheet.

The same applies for graph display. Display the desired graph and click on it to make it active. Then select [Edit] → [Copy] to copy the graph to the clipboard.



You can use for example the Paste command in WordPad to paste the graph into a document.

12.2 Paste

Selecting [Edit] → [Paste] inserts the contents of the clipboard at the current cursor location. This can be used for example to repeatedly paste identical strings during particle counter setup.

12.3 Clipboard - Open

This command serves to open the Windows clipboard, for example to verify whether the desired content has been copied. When using Windows 95, the Clipboard Viewer must be installed.

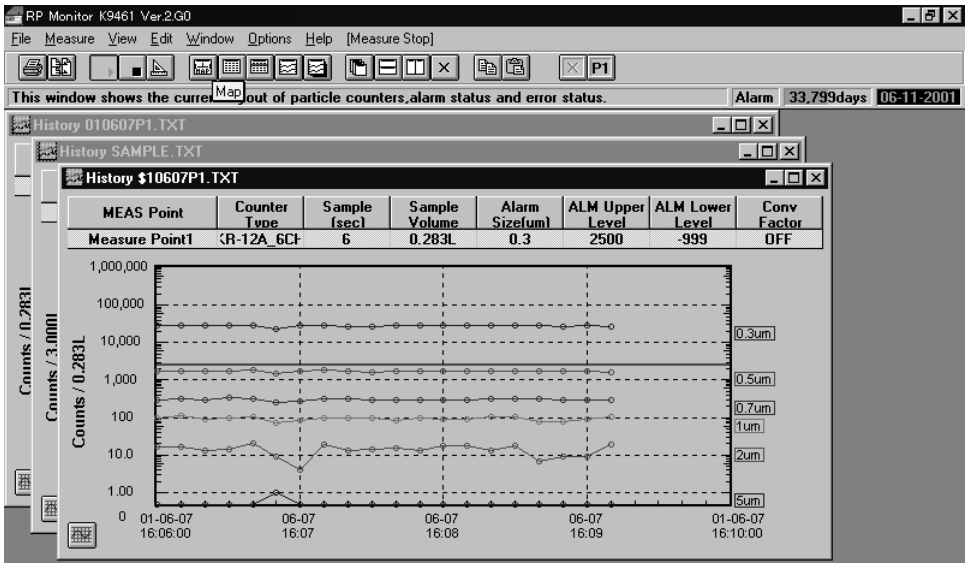
12.4 Clipboard - Close

Serves to close the clipboard.

13. Windows Menu

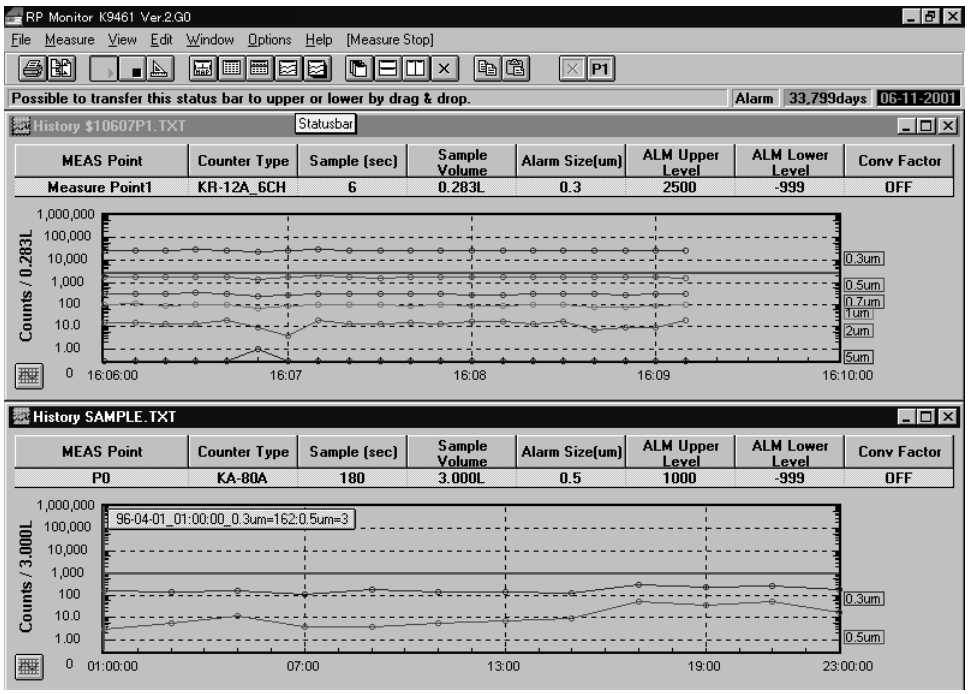
13.1 Cascade

When multiple windows are open, this command lets you arrange the windows so that all title bars are visible.



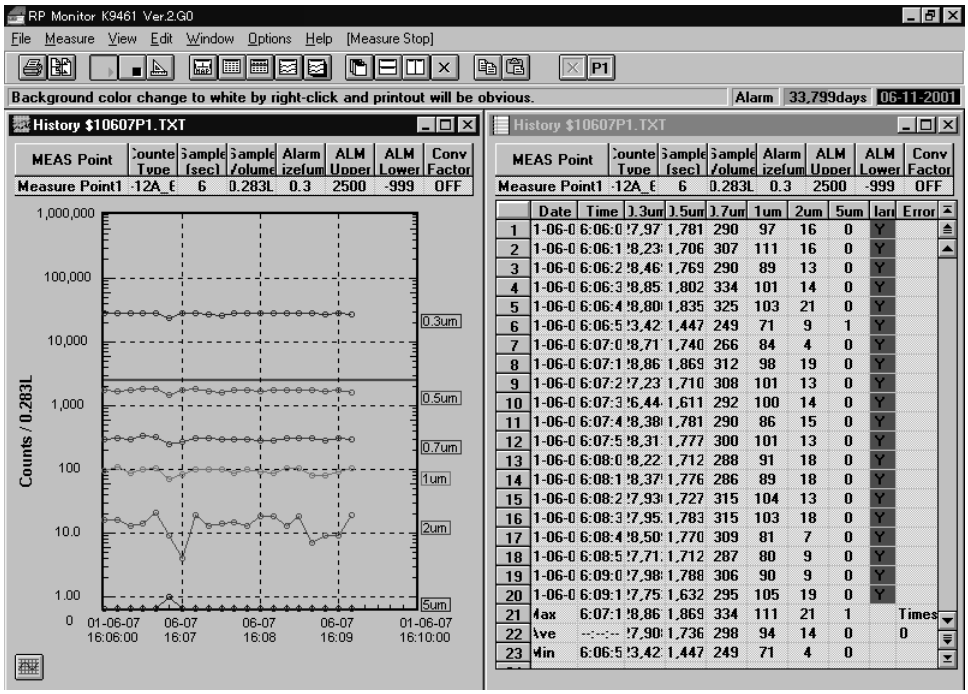
13.2 Horizontal Tile

This command automatically adjusts window size so that windows can be viewed vertically side-by-side. The currently active window is placed at the top left.



13.3 Vertical Tile

This command automatically adjusts window size so that windows can be viewed horizontally side-by-side. The currently active window is placed at the top left.



13.4 Arrange Icons

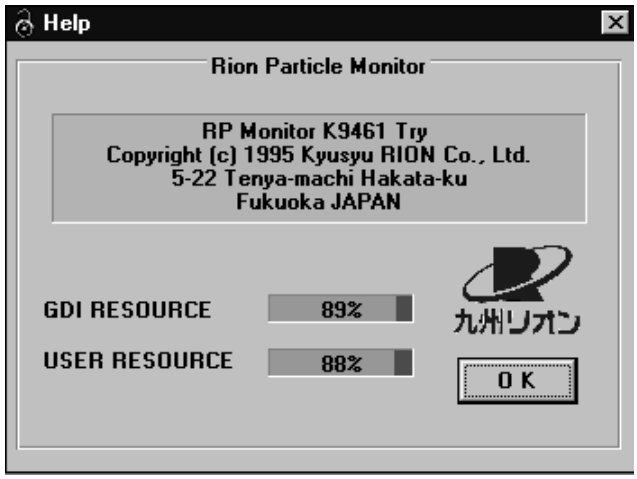
This command arranges the icons for minimized windows at the bottom of the RP Monitor screen.

13.5 Close

This command closes the currently active window. Before using the command, click the mouse on any part of the window to make it active.

14. Help

The [Help] command brings up a display containing version information and information about available resources.



GDI Resources

GDI stands for Graphic Device Interface. It manages drawing information used by Windows. When GDI resources are low, drawing instructions by applications cannot be properly processed. RP Monitor checks the GDI resources before opening a window. When resources are at 10% or less, it will not open a new window. Close any windows that are no longer needed.

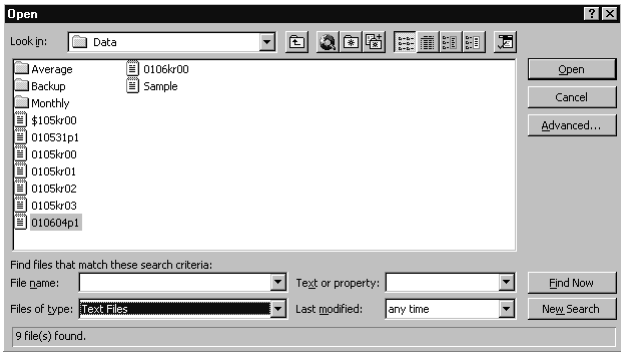
USER Resources

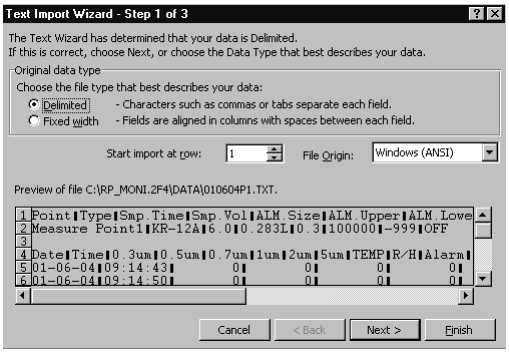
Manages information about opened windows and window status. When USER resources are low, new windows cannot be opened. RP Monitor checks the USER resources before opening a window. When resources are at 10% or less, it will not open a new window. Close any windows that are no longer needed.

15. Exporting Data to Excel

How to import data into Excel 97

1. Start up Microsoft Excel.
2. Select [File] → [Open].
3. Select "text file" (*.prn;*.txt;*.csv) as [File Type].
4. Enter the RP Monitor data folder as the browse target folder.
5. From the file list, select the desired file by clicking on it, and then click on the [Open] button.
6. The text file wizard starts up. Click on [Next] and then [Finish].
7. The RP Monitor data are read into Excel.





Note:

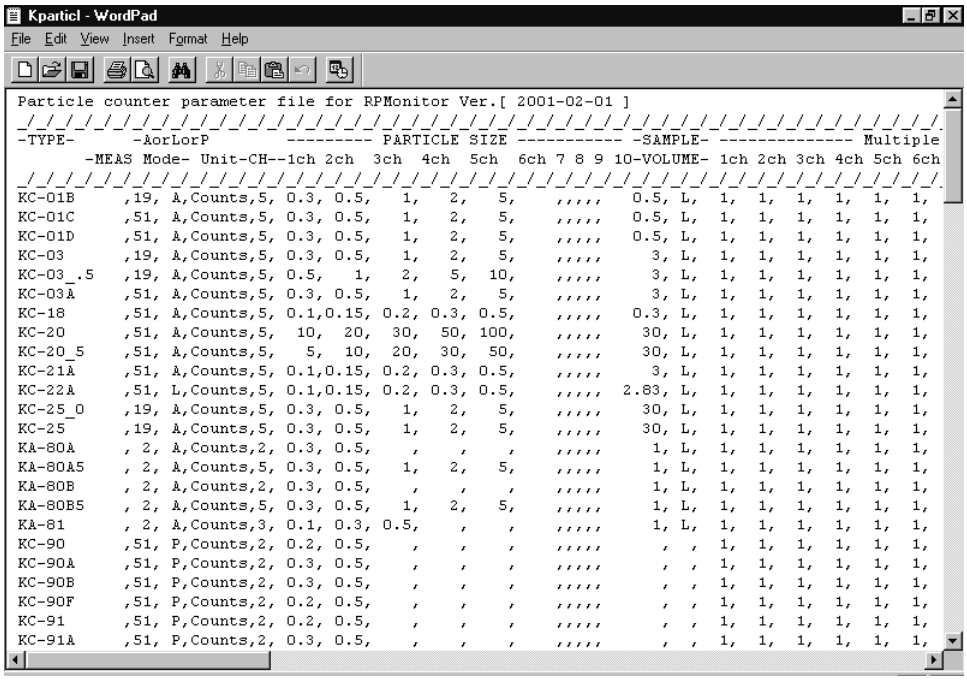
RP Monitor does not lock open files. Therefore it is possible to read a current measurement data file into Excel, although that file is still being used by RP Monitor. However, Excel will lock the file, causing RP Monitor to lose access to it. This will cause an error if measurement is in progress, and prevent further measurement. You should therefore not read current measurement data files into Excel.

Also note that if a large file is being read into Excel while RP Monitor carries out measurement with another file, the required processing resources may cause a measurement error.

16. Customizing RP Monitor

RP Monitor reads particle counter information from the file KPARTICL.INI located in the \RP_MONI folder. By editing the contents of this file, it is possible to modify the display contents, change communication parameters, and add new particle counter types.
Proceed with care when editing the file KPARTICL.INI. When the file is damaged, measurement and measurement data read-in cannot be performed correctly. Before making any changes to the file, you should always make a backup copy. If the file has been damaged, you have to reinstall RP Monitor using the setup floppy disk.

An example for the contents of KPARTICL.INI as opened with Wordpad is shown below.



Example 1: Changing the particle size settings for particle counter KL-28B

Change particle sizes 0.2 um and 0.5 um to 0.25 um and 0.3 um.
In the KL-28B line, change PARTICLE SIZE CH1 to 0.25 um and CH2 to 0.3 um, and change -SizeSw- from 1 to 0.

Example 2: Change sample volume of particle counter KS-93

Change sample volume from --- to 100 mL
In the KS-93 line, set parameter -A or L or P- to A and SAMPLE VOLUME to 100 mL.

Example 3: Provide compensation for detection efficiency of KS-16 (72%)

In the KS-16 line, change parameter (%) from 100 to 72. On particle counter setup, set Conv = 10 mL. If Conv = OFF, compensation is not provided.

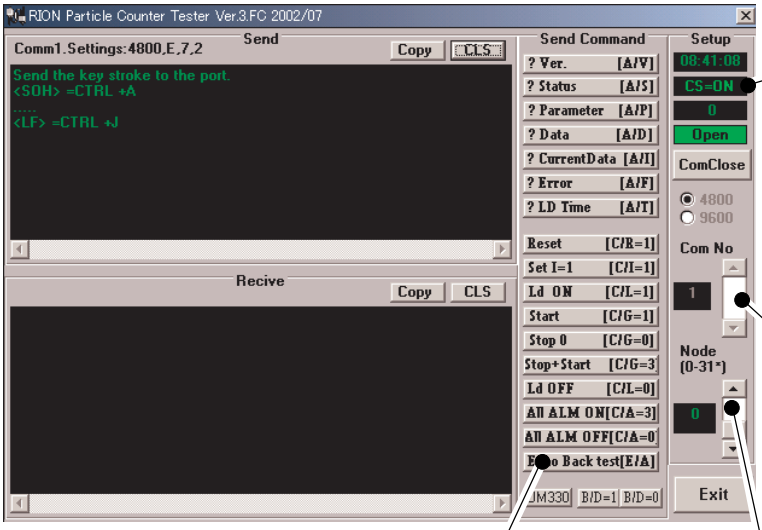
After making the above changes, save KPARTICL.INI and restart RP Monitor. If a measurement data file is already present, it should be deleted or moved to another folder, to prevent mixups caused by different measurement parameters.

Please refer also to the Q_AND_A.DOC file which contains information about other customization methods.

17. Using the Supplied Programs

17.1 Communications check program KCHKR485.EXE

This is a communications test program which tests whether communication with a particle counter is carried out properly and whether the particle counter can be controlled remotely. Before using this program, close RP Monitor. Click on the buttons to send commands, and check the operation and response of the particle counter.



485 bus direction indication
CS: OFF Receiving
CS: ON Standby to send
Normally CS=ON (green), with brief periods of CS=OFF (red) when receiving.
Lasting CS=OFF indication contains following error.
- Adapter is not turned on
- COM port number mismatch
- Bus line problem

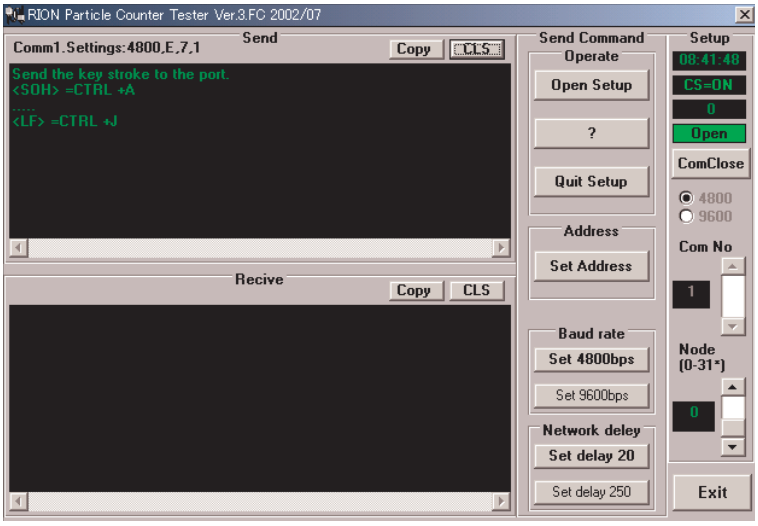
1. Set to COM port number where adapter is connected. To change the setting, set Receive to Off, make the change, and set it to On again.

2. Select node address to communicate with.
0 to 19 (* specifies broadcast)

3. Command buttons: Send instruction to particle counter. Check whether particle counter responds properly.
Reset → Ld ON → Start → Stop → ?Data

17.2 Address setting program KCHKR485.EXE

This program serves for setting the address of the KR-02 etc.



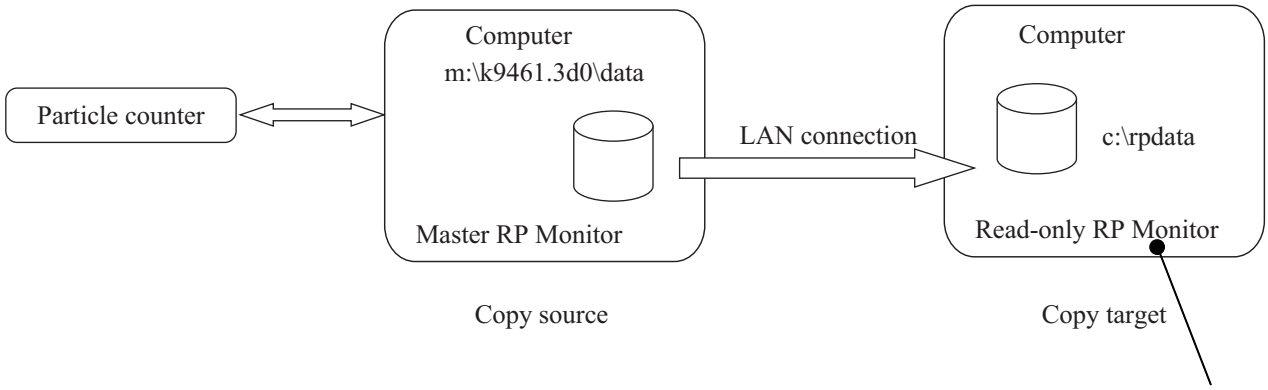
Setting procedure

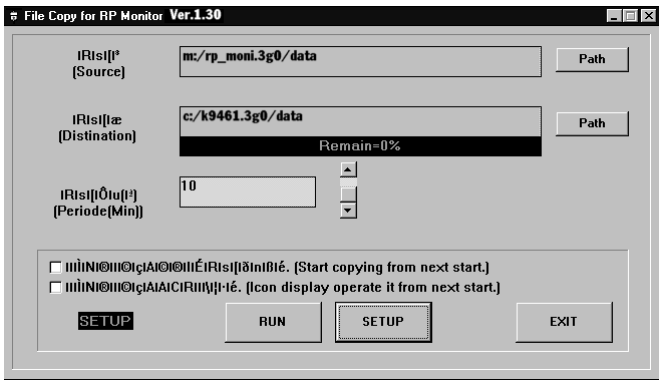
1. Connect the KR-02 via an adapter.
2. Turn on only the KR-02 for which you want to make the setting. It is not possible to make settings for several KR-02 units simultaneously.
3. Within 60 seconds of turning on the KR-02, click on [Open Setup]. A message appears in the receive window. If the message does not appear, first check the connection. If the connection is correct, the baud setting may be mismatched. Click on [Receive] and set the baud rate to 9600. Then click on [Receive] again and repeat the procedure from step 2.
4. After selecting the address, click on [Set Address]. You can now set the address.
5. Click on [Set Delay 20] and set the network delay to 20 ms.
6. Click on [Quit Setup] to complete the setting.

17.3 File copy program KFILECPY.EXE

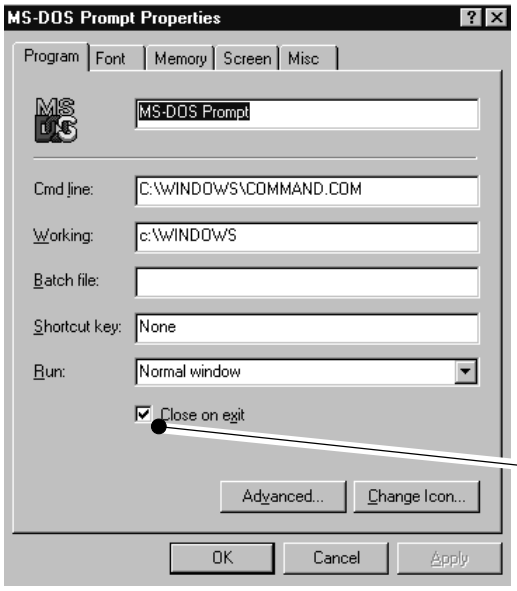
This program serves for periodically copying measurement data files (*.TXT) to another computer. By making this application resident on the copy target, data files created by the master RP Monitor can be automatically copied to a separate display computer at a different location. The MS-DOS XCOPY command is used for this purpose, and only updated files are copied.

Example:





Make KFILECPY.EXE resident on the target computer. Do not make the program resident on the computer with the master RP Monitor.



In the MS-DOS properties for XCopy, check the "Close on exit" mark.

18. Measurement Data Output Format

Measurement results (measurement date and time, measurement count) as well as information about alarm status and error status (fatal error, non-fatal error) can be output to external equipment via the RS-232C interface.

18.1 Measurement Data Output

1. The communication parameters are 9600 bps, 8 data bits, 1 stop bit, non-parity, asynchronous.
2. When sampling for one measurement point is completed, the result is sent as one frame. This is called a measurement data frame.
3. The structure of a measurement data frame is shown below.

STX	Measurement data part	BCC	CR	LF

The first byte is always "STX" (02H). Bytes 2 to 192 are the measurement data for the respective node, in the format shown in the table below. BCC is applied to this section. The next 2 bytes are the BCC code in ASCII format which is calculated by XOR processing of all 191 measurement data bytes. Finally, CR and LF (0x0a, 0x0d) are appended, resulting in a fixed-length frame of 196 bytes. This frame is sent at intervals of at least 500 milliseconds. No response frame is required.

4. Measurement data frame configuration (measurement data part)

Content	Length	Example	Comments	
Measurement point number	3byte	001 to 999 (3-digit ASCII)	BCD (*1)	
Group number	2byte	01 (2 ASCII characters; fixed to 01)	BCD	
Measurement point	4byte	4 ASCII characters	Example: _P1	
Measurement date	8byte	19970420	April 20, 1997	
Measurement time	6byte	233456	23:34:56	
Alarm status	1byte	0 or 1	0:N, 1:Y	
Error status	1byte	0 or 1 or 2	1:Non-fatal, 2:Fatal	
Error message	16byte	Cell NG		
CH 1 size	7byte	0.1um		
CH 2 size	7byte	0.2um		
CH 3 size	7byte	0.3um		
CH 4 size	7byte	0.5um		
CH 5 size	7byte	1um		
CH 6 size	7byte	2um		
CH 7 size	7byte	5um		
CH 8 size	7byte	Temp		
CH 9 size	7byte	Humid		
CH 10 size	7byte			
CH 1 measurement result (×100 value)	8byte	00000000 (8 hex digits)	=0 (decimal measurement result)	
CH 2 measurement result (×100 value)	8byte	12345678 (8 hex digits)	=3054198.96	Measurement value is multiplied by 100 and converted into a 32-bit integer which is expressed in ASCII format.
CH 3 measurement result (×100 value)	8byte	151F1C64 (8 hex digits)	=3543604.2	
CH 4 measurement result (×100 value)	8byte	0000A1DC (8 hex digits)	=414.36	
CH 5 measurement result (×100 value)	8byte	12F1E115 (8 hex digits)	=3178416.85	
CH 6 measurement result (×100 value)	8byte	00878F54 (8 hex digits)	=88840.52	
CH 7 measurement result (×100 value)	8byte	00B4168A (8 hex digits)	=118022.5	
CH 8 measurement result (×100 value)	8byte	9456D54C (8 hex digits)	=-18062486.28	
CH 9 measurement result (×100 value)	8byte	FFFFFFFF (8 hex digits)	=-0.01	
CH 10 measurement result (×100 value)	8byte	7FFFFFFF (8 hex digits)	=21474836.47	

The RS-232C measurement data output format shown above applies to the condition when "KF-02B" (10-channel) is selected (default condition).

(*1): The measurement point number is the same as the line position registered in the setup window.
(RS-232C mode COM1 = measurement point number 1, multi-point mode (R).(M) Node0 = measurement point number 1)

18.2 Alarm Reset Output

1. Alarm reset output format

SOH	Text "AlarmReset"	CR	LF

2. Alarm reset output timing

Output every time the alarm reset icon is clicked during measurement.

3. Other information

- Measurement data output has a different start delimiter SOH (01H) and no BCC.
- Character string length is fixed to 13 bytes.
- This output is used for resetting the optional alarm unit.
- The alarm reset output is sent only when the measurement data output format is "KF-02B" (10-channel) (default condition).

18.3 RP Monitor Version and Alarm Unit Combination Table

The measurement data output format differs depending on the RP Monitor version. The table below shows how alarm unit operation is affected by the different versions.

RP Monitor version	Alarm unit version	Operation	Comments
2.A0 and later 3.A0 4.A0	K9710 Ver3	Compatibility: A RS-232C measurement data output format was developed for 6-channel.	None
2.F0 and later 3.F0 4.F0	K9710 Ver3	Compatibility: B Change RS-232C measurement data output format from "New" (8-channel) to "Old" (6-channel).	None
2.G0 and later 3.G0 4.G0	K9710 Ver3	Compatibility: B Change RS-232C measurement data output format from "New" (8-channel) to "Old" (6-channel).	None
	K0117 Ver1.3	Compatibility: A Use RS-232C measurement data output format "KF-02B" (10-channel). (This is the default.)	Alarm relay can be reset by mouse operation.

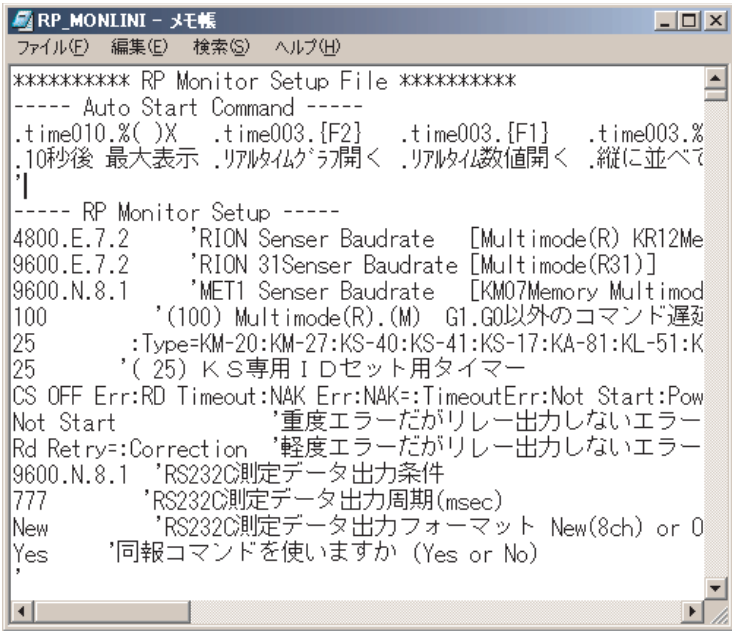
Compatibility

A: No change required.

B: Make indicated change to enable use.

18.4 RP Monitor Measurement Data Output Change Method

1. Use Notepad to open the RP_MONI.INI file located in the folder where RP Monitor is installed (for example RP_MONI.2G0).
2. The contents of RP_MONI.INI are shown, as below.

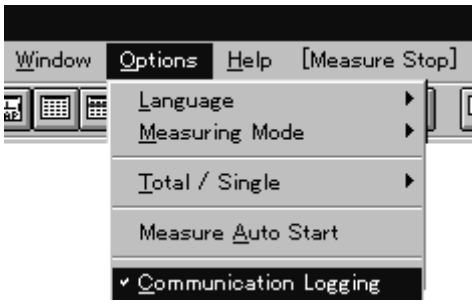


3. Change the RS-232C measurement data output format from KF-02B to "New" or "Old".
4. Perform this procedure while RP Monitor is not running.

19. Communication Logging

1. From the menu, select [Options] → [Communication Logging].
   When this option is checked, you can record information about the communication between RP Monitor and particle counters in a log file. This is useful for example to trace and identify causes of communication errors.

2. Communication history data can be recorded only in the modes listed below. In other modes, the menu option does not appear.
   RS-232C Mode
   Multi Mode (R)
   Multi Mode (M)



20. Log Files

1. Operation history (RP_log.txt)

Records information about operation history.

2. Measurement communication history (XX_log.txt)

Records data sent and received via the serial port during measurement. The "XX" in the file name stands for the file creation date. Consequently, one month's worth of files (most recent month) can be recorded.

3. File size

The required amount of disk space for the measurement communication history log file is about 15 megabytes for Period 60, 1 node, 1 month continuous measurement. Therefore, if there are 20 nodes, 300 megabytes will be required for 1 month continuous measurement. Because data older than 1 month will be subsequently overwritten, this figure represents the upper limit.

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