MiCAT
Mitutoyo Intelligent Computer Aided Technology
the standard in world metrology software
SENSOR

No. 99MBC098A8
SERIES No. 542

SENSORPAK

Ver.3.001A

Measurement data loading software for sensor equipment

User's Manual (Software Guide)

Read this User's Manual thoroughly
before operating the instrument. After reading,
retain it close at hand for future reference.

Mitutoyo

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CONVENTIONS USED IN THIS MANUAL

Types of Notes

The following types of **notes** are used in this manual to help the operator obtain reliable measurement data through correct instrument operation.

IMPORTANT An *important note* provides information essential to use the product. You cannot disregard this note.

An *important note* is a type of precaution, which if neglected could result in degraded performance or accuracy, or instrument malfunction/failure.

NOTE A *note* provides information to be especially noted or supplemented to use the product.

A *note* also supplies information to be noted for specific operations (e.g., memory limitation, instrument configuration, or details that apply to specific versions of a program).

TIP A *tip* is a type of note that helps the user to apply the operation method and procedures to his or her specific conditions.

A *tip* also indicates the reference destination if there is information to be referred to.

Contents

Service Network

MEMO

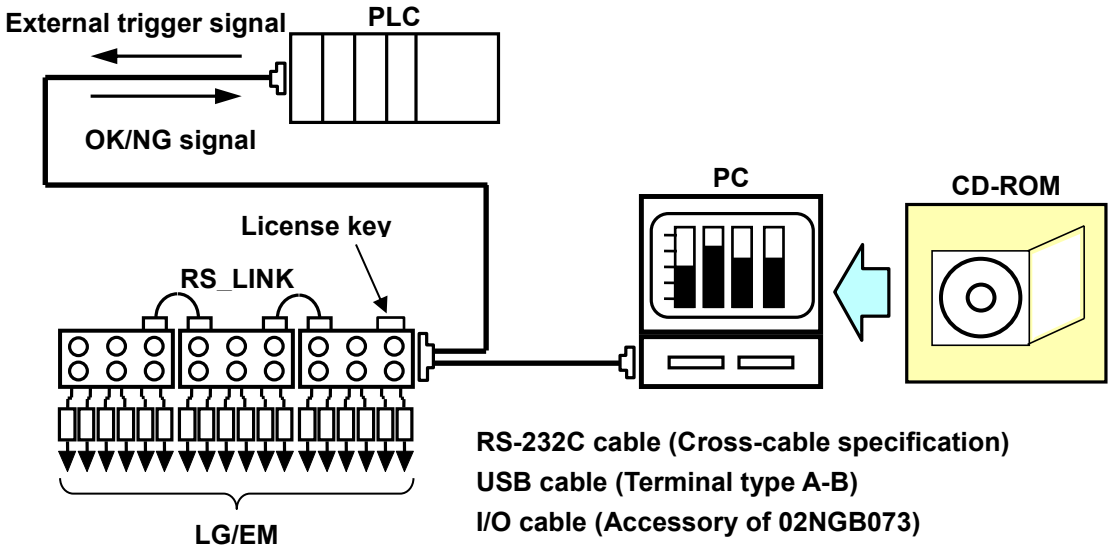
1 About SENSORPAK

1.1 Outline

This software (SENSORPAK) is a “data display/manipulation” software program to support a multiple-point measurement system. It has the following features:

- Multiple-channel data from, for example, LGs or Electronic micrometers can be displayed on a personal computer in real time.
- Various graphical displays of, for example, bar graphs, and meters are possible according to the purposes.
- Direct output of measurement data to the Excel spreadsheet is possible, supporting user data processing.
- External output of the total OK/NG tolerance judgment results is possible (when using an I/O module), allowing an automatic measurement system to be built in combination with, for example, a sequencer.

1.2 System Configuration



RS-232C cable (Cross-cable specification)
USB cable (Terminal type A-B)
I/O cable (Accessory of 02NGB073)

Software	:	Supplied on CD-ROM
License key	:	Standard accessory
RS-232C cable	:	Connect the personal computer to the counter through an RS-232C interface (using a Customer-supplied cable). For details, Refer to Section 2.5.1.2 “Connector and Cable Specifications”
USB cable	:	When the counter is USB correspondence, the USB cable (Terminal type A-B) can be used.
I/O cable compatible with RS-232C	:	Used for synchronization with an external device such as a sequencer (optional). Available for external TRG signal input and the total tolerance judgment output (OK/NG). The I/O cable is also used as the RS-232C cable for the connection with the counter.

1.3 Functions/Performance

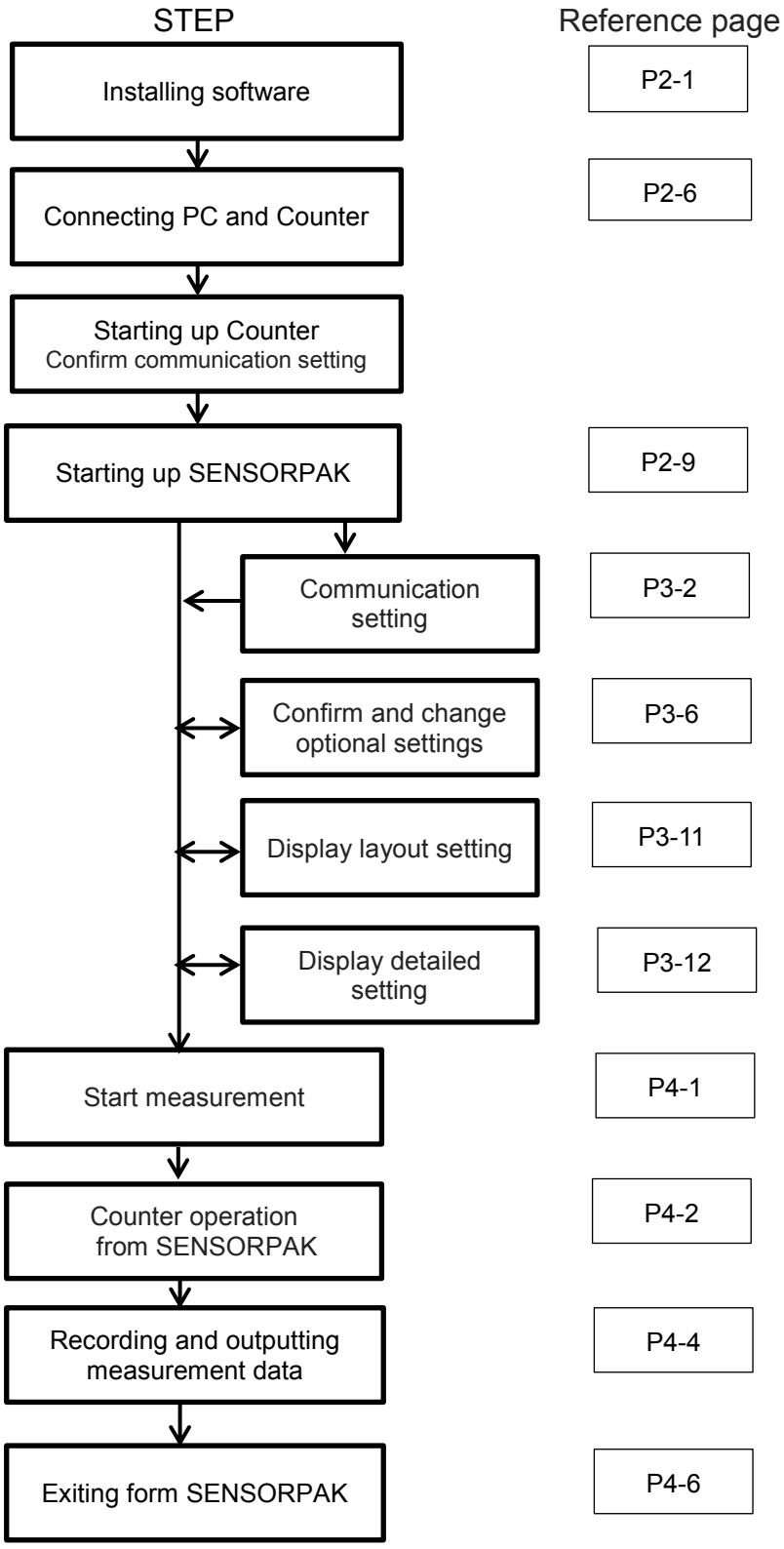
Display functions (the number of displayable channels)	Counter display, bar graph, analog meter (maximum 60 channels).
Display cycle time	1s (per 60 channels, one window display, no output to EXCEL, and under recommended operating conditions). Varies depending on the personal computer used, the number of channels connected, and RS-232C settings.
Calculation functions (maximum calculation items)	Various types of calculations performed on data from selected gages (maximum 30 items). Calculation items: Sum, difference, maximum, minimum, maximum - minimum, total, average, etc.
Counter control functions	Zero set, preset, error clear, tolerance setting.
Tolerance judgment function	Setting of 3 or 5 step tolerances for each channel and color coded display of the judgment results (green/red).
Total tolerance judgment function	Performs total tolerance judgment on the result with the operator AND on all channels specified.
Logging function (maximum logging number)	Logging the data of each channel, calculated result data, tolerance judgment result, total tolerance judgment, and time stamp (60,000 times in 6 channels to 9,000 times in 60 channels).
Logging display function	Table, Chart.
Logging trigger function	Key, timer, external trigger (when used with an option), and counter HOLD signal (except for EF counter) are available for selective use.
Logging data output function	Direct output to the EXCEL spreadsheet, CSV file (for the MeasurLink).
External output function	Total tolerance judgment OK/NG (when using an optional I/O module).
Connectable instrument	Mitutoyo instrument compatible with RS_LINK (such as EH, EV counters).
Operating environment	OS: Windows7, Windows8.1 (32-bit, 64-bit), Windows10 (64-bit) CPU: DOS/V compatible PC (with RS232C port), Pentium4 2GHz or more Memory: 2 Gbyte or more Display: 1024x768 or more Excel: EXCEL 2007, 2010, 2013 (required for using the direct output function of the EXCEL spreadsheet)
RS-232C communication specification	Home position: DTE terminal; cross-cable to be used. Communication method: Half-duplex, non-procedure Baud rate : 4800, 9600, 19200 ,38200 bps Bit configuration Start bit : 1 Data bit : 7, 8 ASII, upper case Parity bit : Non, even, odd Stop bit : 2
USB communication specification	USB2.0

Standard accessories

Code No.			Name	Quantity
02NGB072	02NGB073	02NGB074		
✓	✓	✓	Program CD	1
✓	✓	✓	License key	1
✓	✓	----------	User's Guide (This manual)	1
✓	✓	----------	User's card	1
----------	✓	----------	I/O cable (Part No.02ADL180)	1
----------	✓	----------	I/O cable plug	1

1.4 Measurement flow

When using this software (SENSORPAK), observe the following series of operating procedures to the end of measurement.
This manual describes the procedures according to the following flow.



1.5 Precautions for Use

- Avoid starting other software programs.
  Avoid installing and starting other software programs (other than this piece of software and EXCEL). Otherwise, unstable system performance may result.

- When changing any counter setting, be sure to exit the software and then restart the counter.
  If any counter setting is to be changed, be sure to stop monitoring (described later) of the software beforehand. There are also some counter settings that will be enabled only after the counter is restarted. If this is the case, first exit this software before turning off the power to the counter, restart the counter and then reboot the software.

- Precautions about update time of display data
  This software uses RS-232C (serial interface) for communication with the counter.
  This varies sampling time of data from gages depending on the number of counters to be connected. It takes also up to 30 ms per gage to collect measurement data from gages. Therefore, the more the number of gages to be connected, the more time is required to update display data.
  In dynamic measurement such as scanning measurement, use this software in due consideration of the above restrictions.

- Precautions for continuous measurement over an extended time period
  When implementing continuous measurement over an extended time period, prepare a stabilized power supply for the power to the PC and counters. If the software is unexpectedly exited due to a power failure, etc., measurement data may be lost and damaged.
  The continuous operating time of this software depends on a PC to be installed.

- Precautions for use abroad
  This software defines ". (dot)" as a decimal point and will not use any digit grouping separator.
  Depending on the country, ", (comma)" represents a decimal point and ". (dot)" represents a digit grouping separator, but this software will not be compatible with these representations. If this software is used abroad, above representations will not allow any proper value to be entered. Care should be exercised.

2 Setup

2.1 Before Performing Setup

2.1.1 Setup Procedure

Perform the setup according to the following procedure.

(1) Install SENSORPAK.

(2) Install USB driver.

When the PC is connected to the counter via USB, this step is required.

When the PC is connected to the counter via RS-232C, this step is not required.

(3) Connect the PC to the counter.

(4) Start up and exit from SENSORPAK.

IMPORTANT Be sure to perform the setup according to the procedure described in this manual. Otherwise, SENSORPAK may not operate correctly.

2.1.2 Program CD

The configuration of folders and files in the program CD is described below:

- Install: Folder of SENSORPAK installer (setup.exe)
- USBdrv: Folder of USB driver installer (Setup.vbs)
- Language: Folder of Localization dll (SENSORPAK_Lang.dll)
- SENSORPAK_SAMPL.xls: Excel sample macro file
- SENSORPAK_SAMPL.xlsm: Same as above

2.2 Installing SENSORPAK

Before installing SENSORPAK,

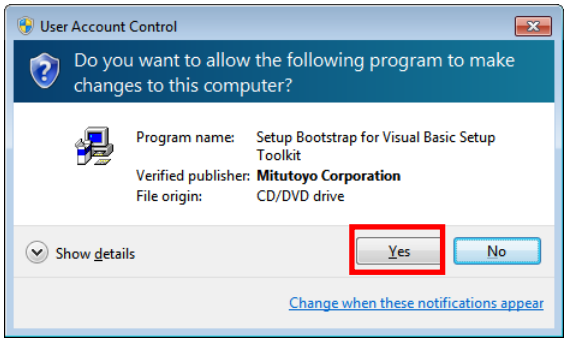
- Turn on the PC, and then log on at the Administrator permission level.
- Exit from all the applications.

(1) Insert the application CD-ROM into the CD-ROM drive.
(2) In the Windows **Explorer**, double-click "**setup.exe**" in the CD-ROM.

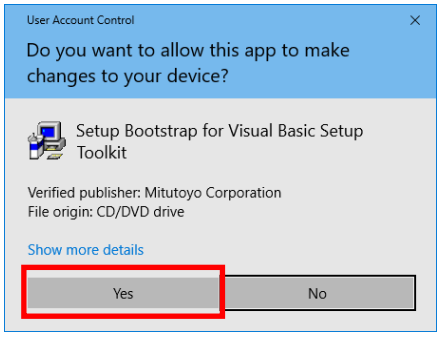
Path: CD-ROM\Install**setup.exe** Refer to Section 2.1.2 "Program CD".

(3) The "User Account Control" dialog box appears. Click on the [Yes] button.

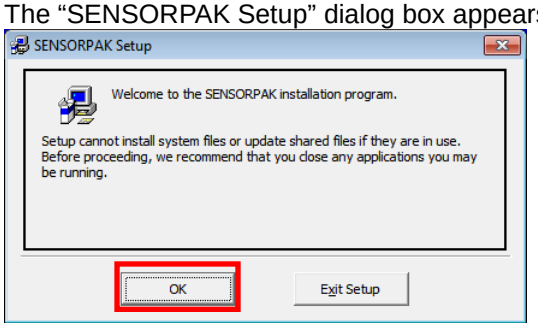
For Windows7



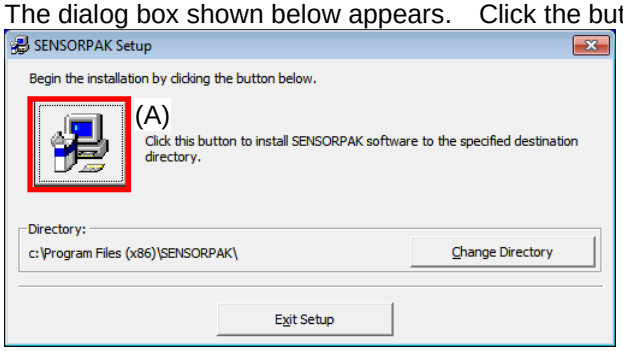
For Windows10



(4) The "SENSORPAK Setup" dialog box appears. Click on the [OK] button.

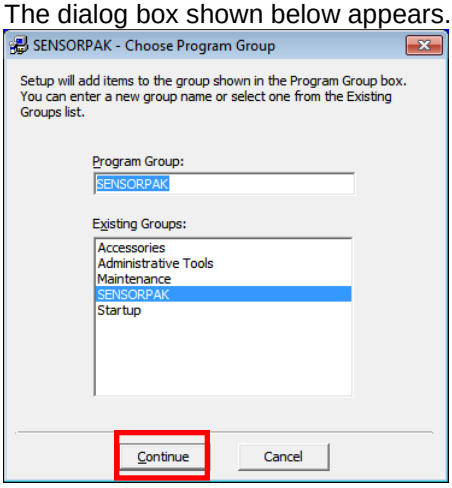


(5) The dialog box shown below appears. Click the button shown by (A) in the figure below.

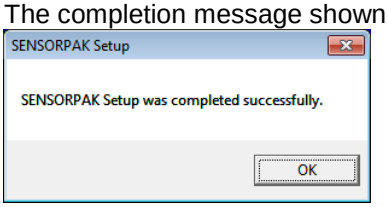


An arbitrary directory (destination path of installation) can be selected. However, Mitutoyo recommends you to use the default directory.

(6) The dialog box shown below appears. Click on the [Continue] button to start the installation.



(7) The completion message shown below appears. Click on the [OK] button.



Thus the installation of SENSORPAK has been completed.
In the destination path set in the above step (5), the directory is created.

NOTE Be sure not to start up SENSORPAK at this point.

2.3 Installing USB Driver

When the PC is connected to the counter via RS-232C, the procedure described in this section is not required.

Before installing SENSORPAK,

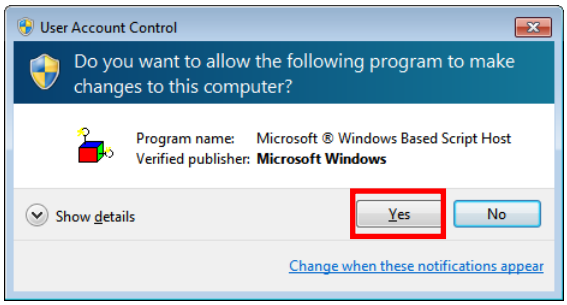
- Turn on the PC, and then log on at the Administrator permission level.
- Exit from all the applications.

(1) Insert the application CD-ROM into the CD-ROM drive.
(2) In the Windows **Explorer**, double-click "**Setup.vbs**" in the CD-ROM.

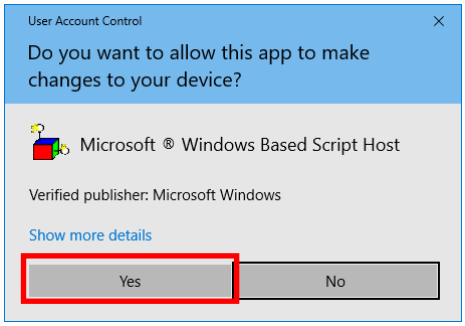
Path: CD-ROM\USBdrv**Setup.vbs** Refer to Section 2.1.2 "Program CD".

(3) The "User Account Control" dialog box appears. Click on the [Yes] button.

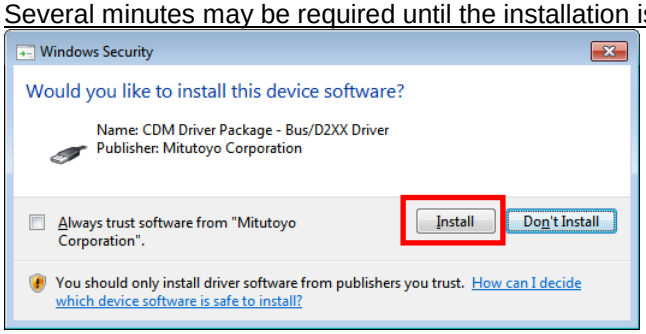
For Windows 7



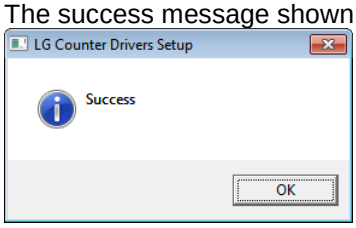
For Windows 10



(4) If the "Windows Security" dialog box shown below appears, click on the [Install] button.
The "Windows Security" dialog box appears 0 to 2 times, depending on the PC environment.
Several minutes may be required until the installation is completed.



(5) The success message shown below appears. Click on the [OK] button.



Thus the installation of the USB driver has been completed.

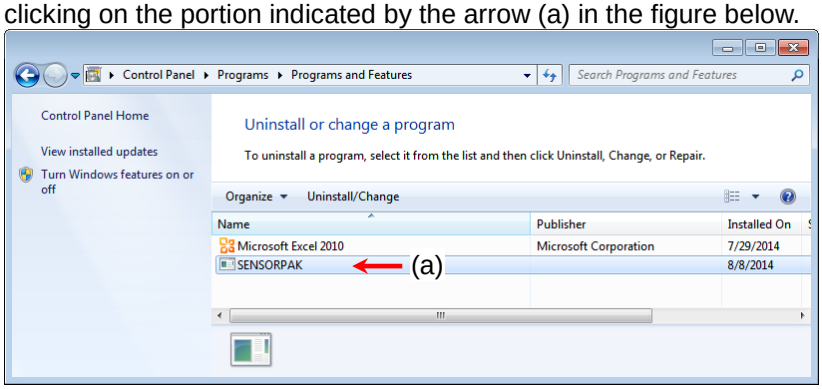
Note that in this installation process, the device driver software of the USB driver has been copied from the CD-ROM to the PC. It is further necessary to set the relationship between the PC and the counter so as to be able to use the device.
Go to Section 2.5.2 "In the case of USB connection".

NOTE Be sure not to start up SENSORPAK at this point.

2.4 Uninstallation

2.4.1 Uninstalling SENSORPAK

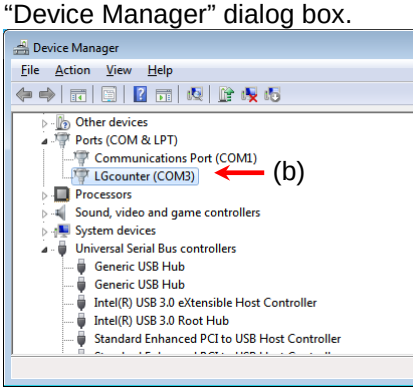
(1) In the Windows, click on [Control Panel | Uninstall a program]. Then uninstall SENSORPAK by clicking on the portion indicated by the arrow (a) in the figure below.

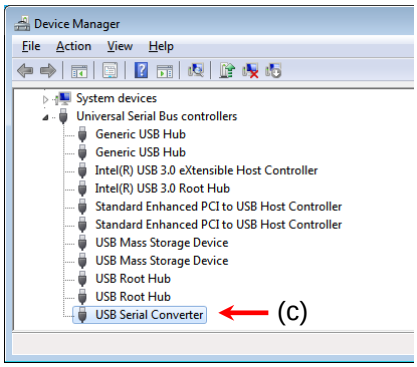


2.4.2 Uninstalling USB Driver

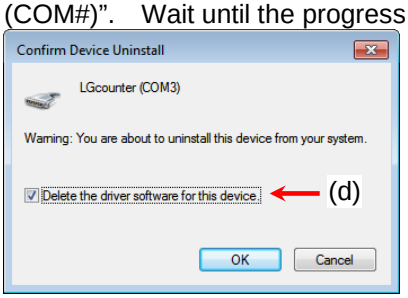
NOTE Be sure to uninstall the USB driver according to the following procedure.

(1) In the Windows, click on [Control Panel | Hardware and Sound | Device Manager] to open the "Device Manager" dialog box.





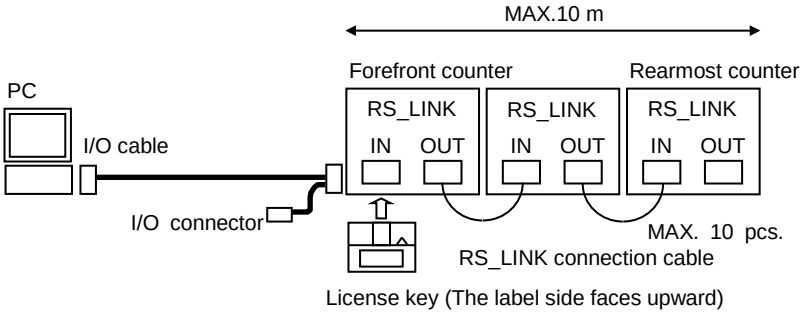
(2) Select "LGcounter (COM#)" indicated by the arrow (b) in the figure above.
(3) From the menu bar, click on [Action | Uninstall].
(4) The "Confirm Device Uninstall" dialog box will appear. Then check the checkbox indicated by the arrow (d), and then click on the [OK] button to start the uninstallation process of "LGcounter (COM#)". Wait until the progress displayed in the progress dialog box is completed.



(5) Select "USB Serial Converter" indicated by the arrow (c) in the figure above.
(6) Perform the above steps (3) and (4) to uninstall "USB Serial Converter".

2.5 Connecting PC and Counter

2.5.1 In the case of RS-232C connection



2.5.1.1 Connection

(1) According to the description of User's Manual of the counter, connect the I/O cable, the RS_LINK connection cables, and the AC cordsets.
- Connect the I/O cable to the RS-232C connector.
- The fork-cable side of the I/O cable should be connected to the counter.
- If you do not use the supplied I/O cable, prepare an appropriate cable by yourself.
- When plural counters are connected to each other via the RS_LINK connection cable, connect the I/O cable to the RS-232C connector of the first counter.

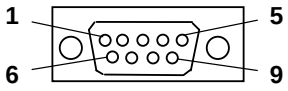
(2) Insert the license key into the "IN" connector of the "RS_LINK" of the counter, to which the RS-232C cable is connected.
(3) Turn on the power to the counter so as to make it ready for counting.
(4) Go to Section 2.5.3 "Confirmation of Communication Port".

2.5.1.2 Specification of Connector and Cable

- Receptacle: D-sub, 9-pin (Male), inch-screw type
- Applicable plug: D-sub, 9-pin (Female), inch-screw type
- Available cable (example): KRS-403XF1K (Cross, 1.5 m) of Sanwa Supply brand of Japan

➢ RS-232C pin assignment (for DOS/V specification)

Pin No.	Signal name	I/O	Description
2	RD(RXD)	IN	Received data
3	SD(TXD)	OUT	Transmitted data
4	CD(DTR)	OUT	Data terminal ready
5	GND	-	Ground
6	CC(DSR)	IN	Data set ready
7	CA(RTS)	OUT	Request for data transmission
8	CB(CTS)	IN	Data transmission enabled
1,9	NC	-	No connection

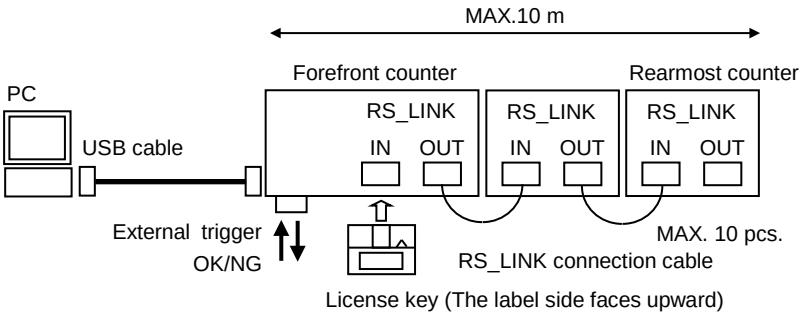


➢ Cable connection example (D-sub, 9-pin, cross-cable specification)

Counter side		PC side
Pin No.		Pin No.
1		1
2		2
3		3
4		4
5		5
6		6
7		7
8		8
9		9

2.5.2 In the cases of USB connection

IMPORTANT Set the parameter of each counter to the USB connection mode in advance, in the state that the PC is not connected to the counter. Refer to User's Manual of the counter.



2.5.2.1 Connection

(1) According to the description of User's Manual of the counter, connect the USB cable, the RS_LINK connection cables, and the AC cordsets.
- Connect the USB cable to the USB connector. Prepare the USB cable by yourself.
- When plural counters are connected to each other via the RS_LINK connection cable, connect the USB cable to the USB connector of the first counter.

(2) Insert the license key into the "IN" connector of the "RS_LINK" of the counter, to which the USB cable is connected.

(3) Be sure not to turn on the power to the counter at this point. Go to Section 2.5.2.2 "Preparation for Using Device".

2.5.2.2 Preparation for Using Device

Set the relationship between the device driver software and the counter so as to be able to use the device.

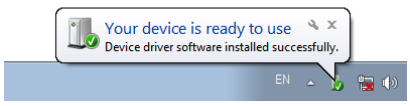
Before performing the procedure described in this section,
- Turn on the power to the PC, and then log on at the administrator permission level.
- Exit from all the applications.
- The procedure described in Section 2.3 "Installing USB Driver" has been completed.

(1) Turn on the power to the counter so as to make it ready for counting.

After turning on the power to the counter, installation of the device driver software of the USB driver is automatically started. Wait for several minutes until the installation process is completed.

When the installation process is completed

- In the case of Windows 7
  The balloon message shown right appears.

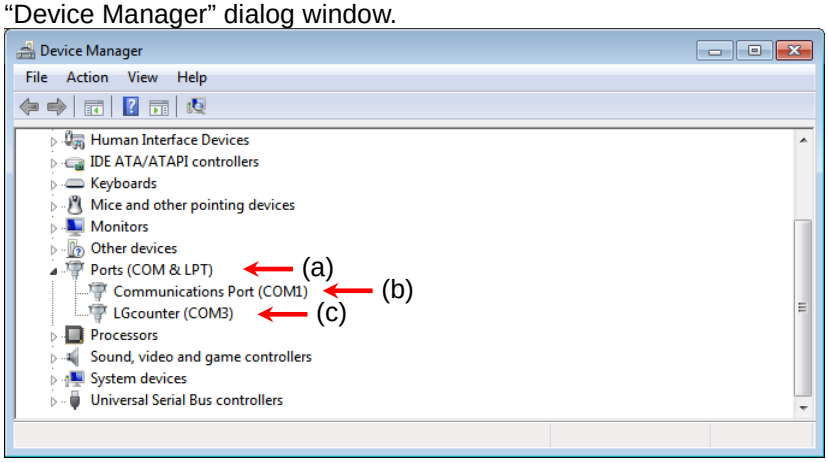


- In the case of Windows 8.1 and Windows 10
  The completion message does not appear.
  Confirm that the installation has been completed, according to the description in Section 2.4.3 "Confirmation of Communication Port".

(2) Go to Section 2.5.3 "Confirmation of Communication Port".

2.5.3 Confirmation of Communication Port

(1) In the Windows, click on [Control Panel | Hardware and Sound | Device Manager] to open the "Device Manager" dialog window.



(2) Confirm the COM port number shown below "Ports (COM & LPT)" indicated by the arrow (a) in the figure above.

- In the case of RS-232C connection

  The COM port number is "#" in "Communications Port (COM#)" indicated by the arrow (b) in the figure above.

- In the case of USB connection

  The COM port number is "#" in "LGcounter (COM#)" indicated by the arrow (c) in the figure above.

TIP To set the communication (port) of SENSORPAK, this COM port number is used.
This COM port number depends on the connected PC.

The default setting in the communication setting (port) of SENSORPAK is "Com1".

2.6 Localization

The displayed language of SENSORPAK can be changed to the desired language, according to the following procedure. This function is not provided in the Japanese-version SENSORPAK.

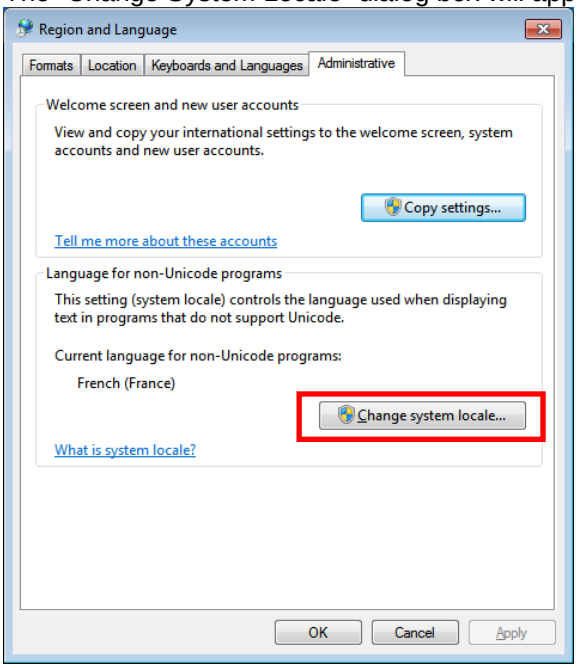
(1) Copy “SENSORPAK_Lang.dll” in the folder A to the folder B.

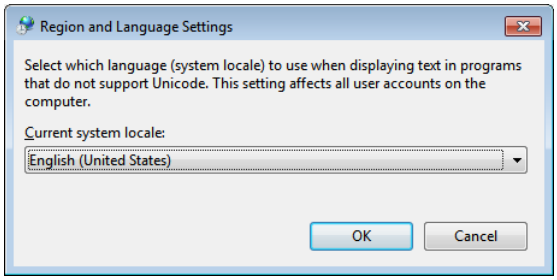
Path of folder A: CD-ROM\Language\[*]\SENSORPAK_Lang.dll
[*]; represents the folder depending on the language

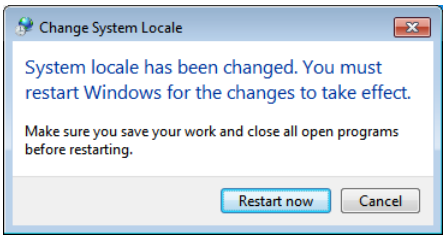
```
CD-ROM
 ├────Language
        ├────English    ─SENSORPAK_Lang.dll
        ├────German     ─SENSORPAK_Lang.dll
        ├────French     ─SENSORPAK_Lang.dll
        ├────Spanish    ─SENSORPAK_Lang.dll
        ├────Czech      ─SENSORPAK_Lang.dll
```

Path of folder B: (Directory path of SENSORPAK)\SENSORPAK_Lang.dll

(2) In the Windows, click on [Control Panel | Clock, Language, and Region | Region and Language] to open the “Region and Language” dialog box. In the “Administrative” tab, click on the [Change system locale…] button to open the “Region and Language Settings” dialog box. From the “Current system locale” drop-down list, select the desired language, and then click on the [OK] button to close the dialog box.
The “Change System Locale” dialog box will appear. Then restart the Windows.







(3) Perform the procedure described in Section 2.6.1 “Starting up SENSORPAK”. Thus the localization is completed.

2.7 Starting up and Exiting from SENSORPAK

2.7.1 Starting up SENSORPAK

IMPORTANT Before starting up SENSORPAK, be sure to confirm the following points:

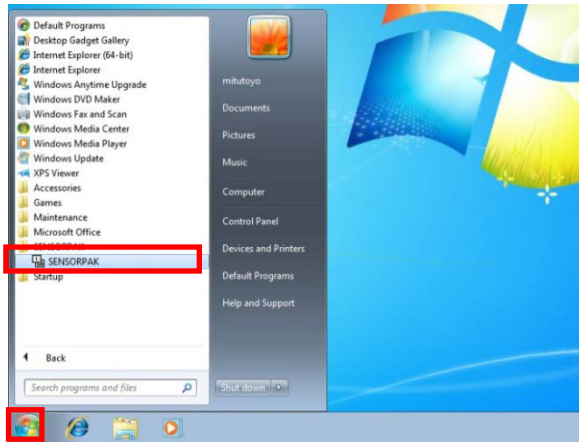
- The counters are connected to the PC correctly.
- The license key is inserted in the predetermined connector of the counter.
- The power to the counter is turned on so that the counter is in the state of ready for counting.

2.7.1.1 How to start up SENSORPAK

The icon on this software is shown on the right.
The location of the icon of each OS is shown below.

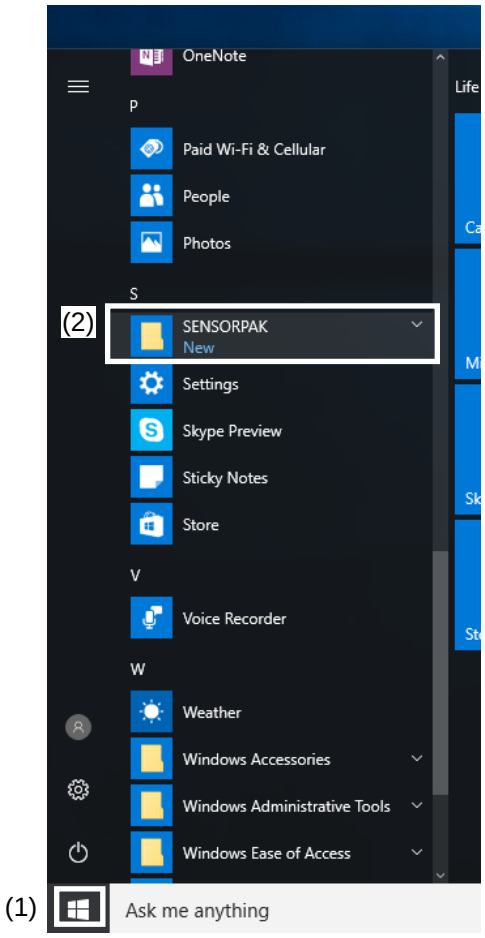

Icon of SENSORPAK

➢ For Windows 7
(1) Open the Window Start menu.
(2) Click the “SENSORPAK” menu item to start up SENSORPAK.

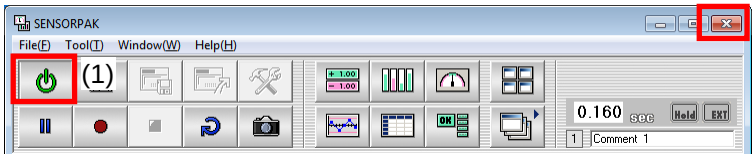


➢ For Windows 8.1
(1) Click the [↓] icon arranged in the lower left corner of the startup window to open the “Apps” window.
(2) Click the “SENSORPAK” icon to start up SENSORPAK.

➢ For Windows 10
(1) Open the Window Start menu.
(2) Click the “SENSORPAK” menu item to start up SENSORPAK.



2.7.2 Exiting from SENSORPAK



(1) Click the [Monitoring ON/OFF] button to stop the monitoring. (The color of the [Monitoring ON/OFF] button is changed from green to red.)
(2) Click the [x] button arranged in the upper right corner to close the “SENSORPAK” window.

MEMO

3 Measurement preparation

3.1 Screen image after software startup

At the time of startup, this software will perform communication with the counter. Upon its first startup, an error will occur because communication setting has not been completed. As long as the license key is connected to the counter without change of any communication setting, measurement can be started immediately when the software starts up next time or later.

3.1.1 Behavior after startup

Communication settings and license key connection

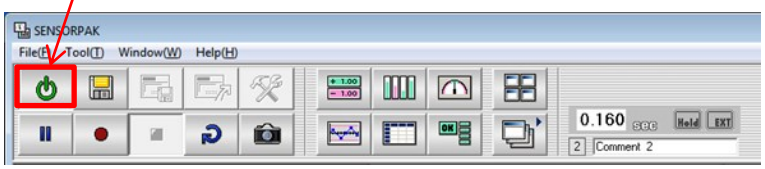
- In the case of OK,

  When SENSORPAK has been started up, communication to the counter is performed, and then the [Monitoring ON/OFF] button indicated by the arrow (A) in the figure below is changed to green (start monitoring).

- In the case of NG,

  During the process of starting up SENSORPAK, error message such as “Unable to communicate with counter.” or “License-Key Not Found.” appears, and the [Monitoring ON/OFF] button indicated by the arrow (A) in the figure below is changed to red (stop monitoring).

Monitoring ON/OFF Button



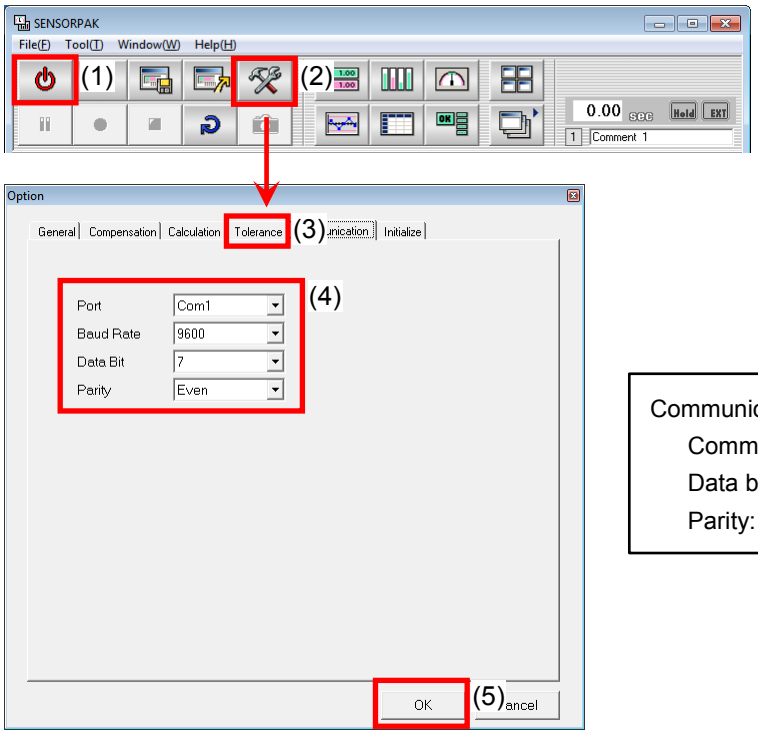
OK : Green (On-Line)

NG : Red (Off-Line)

TIP The error message appears when the communication setting is different between the counter and SENSORPAK so that communication cannot be performed, or when the license key is not inserted.

For how to solve the error message, Refer to Section 6.2. “Error message”.

3.1.2 Communication Setting of SENSORPAK



Communication setting of the counter at shipment

Communication speed:	9600 bps
Data bit:	7 bit
Parity:	Even

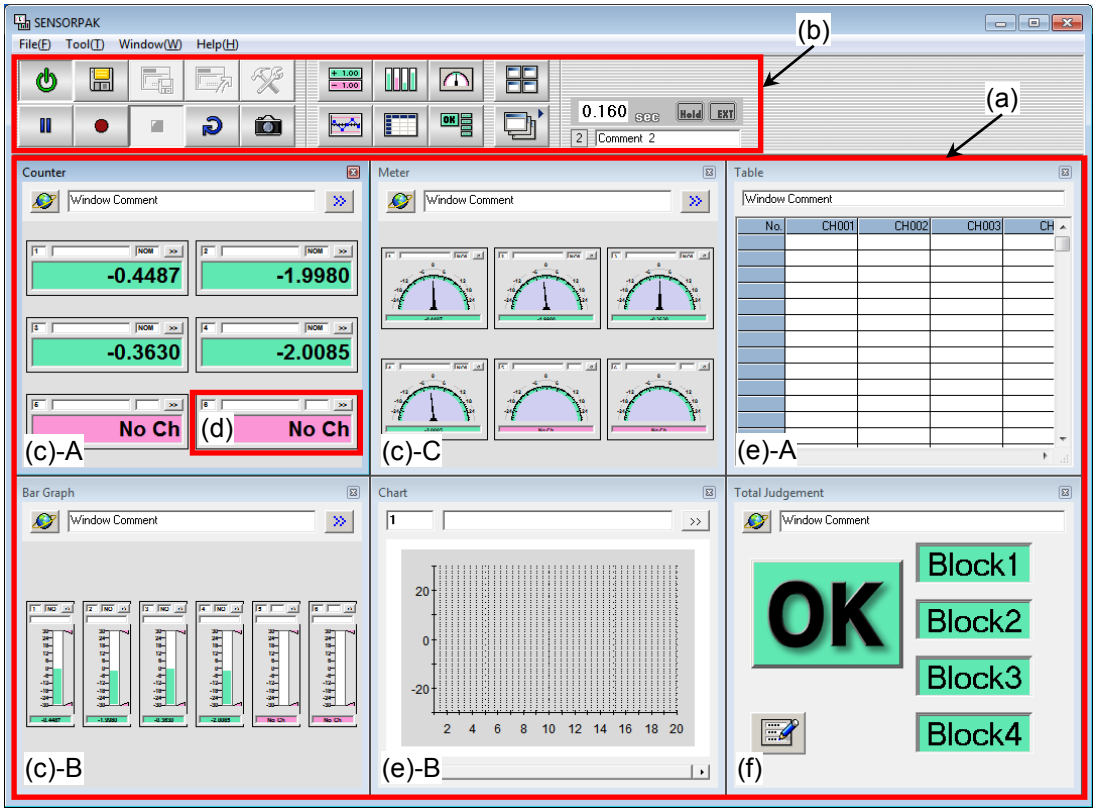
(1) Click the [Monitoring ON/OFF] button to stop the monitoring. (The color of the [Monitoring ON/OFF] button is changed from green to red.)
(2) In the toolbar, click the [Option] button to open the Option Panel.
(3) Click the [Communication] tab to open the communication menu.
(4) Change the contents of the communication menu so that the communication setting coincides with the communication setting of the counter.
(5) Click the [OK] button to close the Option Panel.
(6) Click the [Monitoring ON/OFF] button again to start the monitoring. (The color of the [Monitoring ON/OFF] button is changed from red to green.)

TIP Although the normal COM port setting is “Com1”, the COM port setting may be different. Accordingly, be sure to confirm the communication port of your PC.

Refer to Section 2.4.3 “Confirmation of Communication Port”.

3.2 Whole Screen description

3.2.1 Total image on the operation screen



(a) Display space: It is space where various windows can be arbitrarily arranged.
Up to 12 windows can be displayed.

(b) Toolbar: Monitor ON / OFF, addition of various windows etc. buttons are assigned.

(c) Display window: Display window is available with a desired mode from among the Counter, Bar Graph, and Meter.
Display size changeable. And tolerance judgment result display.

(c)-A; Counter, (c)-B; Bar Graph (c)-C; Meter

(d) Display unit: The result of each channel is displayed.
A maximum of 60 channels can be displayed within one Display window.

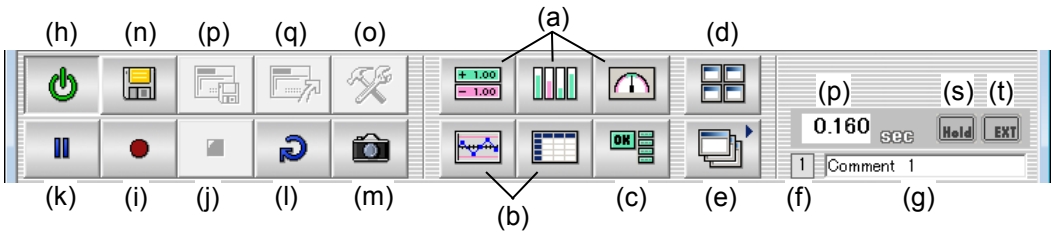
(e) Log window: Log window is available with a desired mode from the table and chart.
Display size changeable.
In the chart mode, the tolerance can also be displayed as a line.

(e)-A; Table, (e)-B; Chart

(f) Total judgment window: Partial judgment is also possible for 4 blocks in addition to the total judgment.
Specification is possible for the channel to be subject to partial judgment.

TIP Information such as the display size and arrangement of various windows placed in the display space can be saved with up to 9

3.2.2 Toolbar



➢ Window control

(a) Display window button: Opens Display windows of the counter, and bar graph, and meter.
(b) Log window button: Displays the windows of logged data in the form of a table or chart.
(c) Total judgment window button: Opens the Total judgment window
(d) Window arrange button : Automatically arranges the display windows.
(e) Layout Save & Recall button: Saves and switches created windows.
(f) Layout number display: Displays the layout number currently on display.
(g) Layout comment: For entering a comment to each layout.

➢ Logging control

(h) Monitoring ON/OFF button: Toggles between monitoring ON (on-line) and monitoring OFF (off-line).
(i) Logging start button: Starts logging.
(j) Logging stop button: Stops logging.
(k) Pause button: Pauses logging.
(l) Cancel button: Cancels the last data logged.
(m) One-shot button: Logs data each time the button is clicked on after the logging started.
(n) Save measurement data button: Saves logged data in a file.

➢ Setting control

(o) Option button: Used to set-up details of conditions.
(p) Save setting file button: Saves set data of layout, preset, tolerances, etc.
(q) Read setting file button: Reads set data saved.

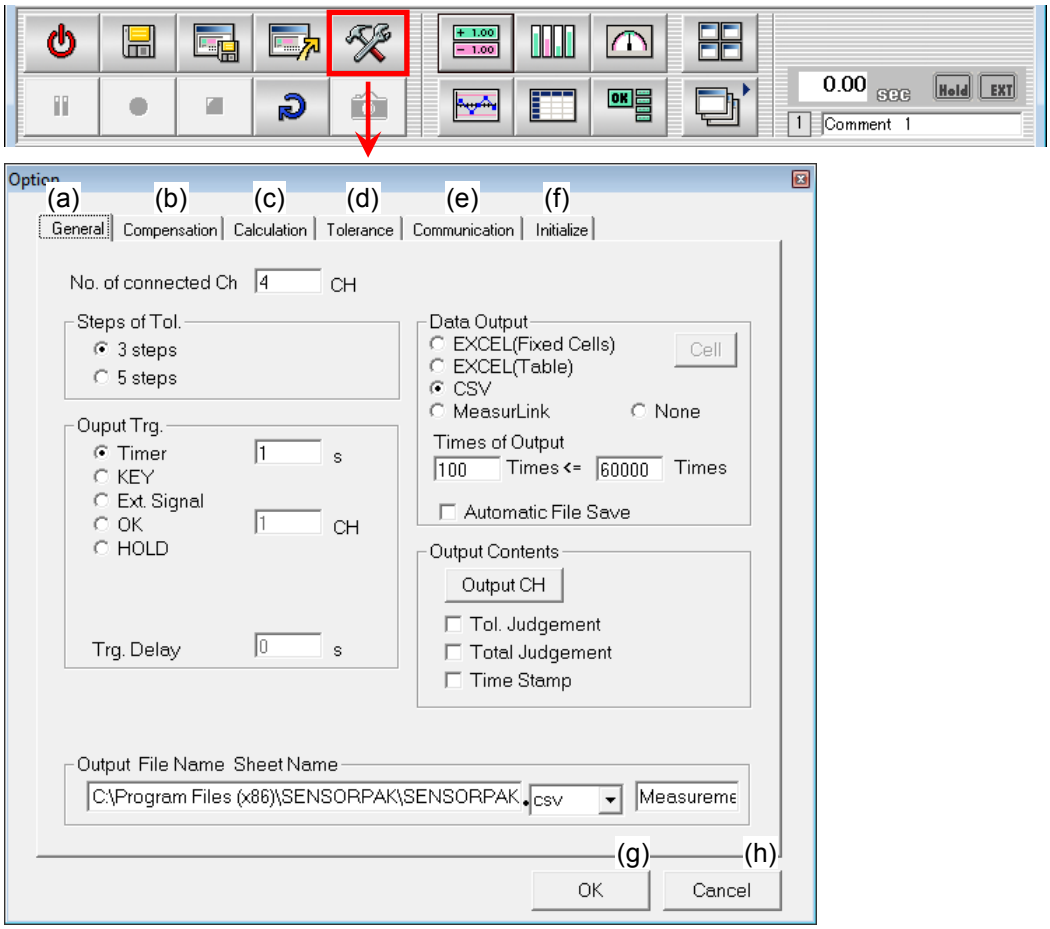
➢ Else

(r) Cycle time indicator: Indicates the time elapsed between data logging and display.
(s) Hold indicator display: Lights at the input of a hold signal into the counter. (except for EF counter).
(t) External TRG signal input display: Lights at the input of the TRG signal with the use of the I/O cable and the external TRG mode.

3.2.3 Option Panel

Used for detailed setting of various items.

Click on the [Option] button of the toolbar and open the Option Panel.



➢ Tab

(a) General: Used for setting up of the tolerance and data logging.
(b) Compensation: Linear compensation is possible for each channel.
(c) Calculation: For the definition and display of the calculation of data from different channels.
(d) Tolerance: Used for setting up the preset value for tolerance setting.
(e) Communication: Used for setting RS-232C details.
(f) Initialize: Used for initializing various settings.

➢ OK, Cancel

(g) OK: Used for accepting the setting and closing the panel.
(h) Cancel: Used for canceling the setting and closing the panel.

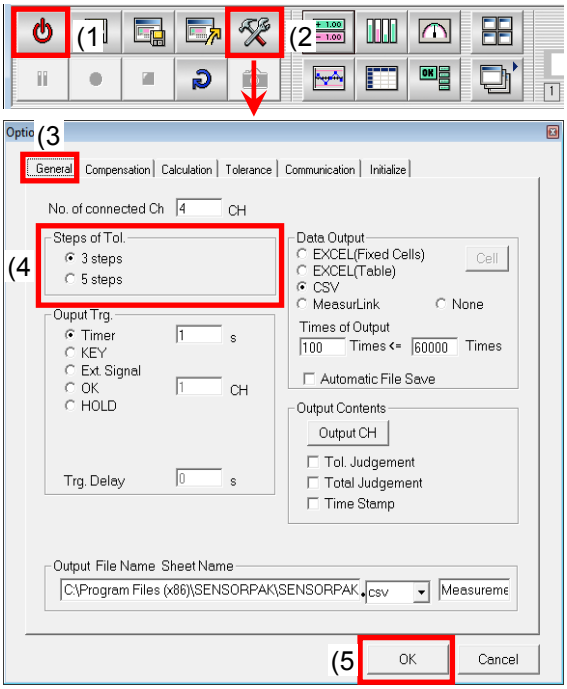
3.3 Optional setting

3.3.1 Tolerance Judgment Function

Sets up 3 or 5 step tolerances for channels all at once or one-by-one in the display window and displays the tolerance judgment result in color.

3.3.1.1 Changing the number of tolerance steps

Select the 3-step tolerance or 5-step tolerance according to the counter.



(1) Click on the [Monitoring ON/OFF] button to turn OFF the monitoring mode.

(2) Click on the [Option] button to open the Option Panel.

(3) Click on the [General] tab.

(4) Turn on the check box of the [3 steps] or [5 steps] as appropriate.

(5) Click on the [OK] button to close the Option Panel.

NOTE An alarm will be displayed if there is a discrepancy in the number of tolerance steps (3-step/5-step) between the counter and SENSORPAK

3.3.1.2 Tolerance tab

You can change the settings in the tolerance setting tag for each channel. You can also set these settings from the Control Panel window of each Windows described below.

(1) Click the [Tolerance] tag.
  (a) Channel No.
  (b) Channel label (arbitrary name)
  (c) Peak mode setting (changed by clicking)
  (d) Preset value
  (e) Tolerance limits (the left table shows the case of 3-step tolerance)

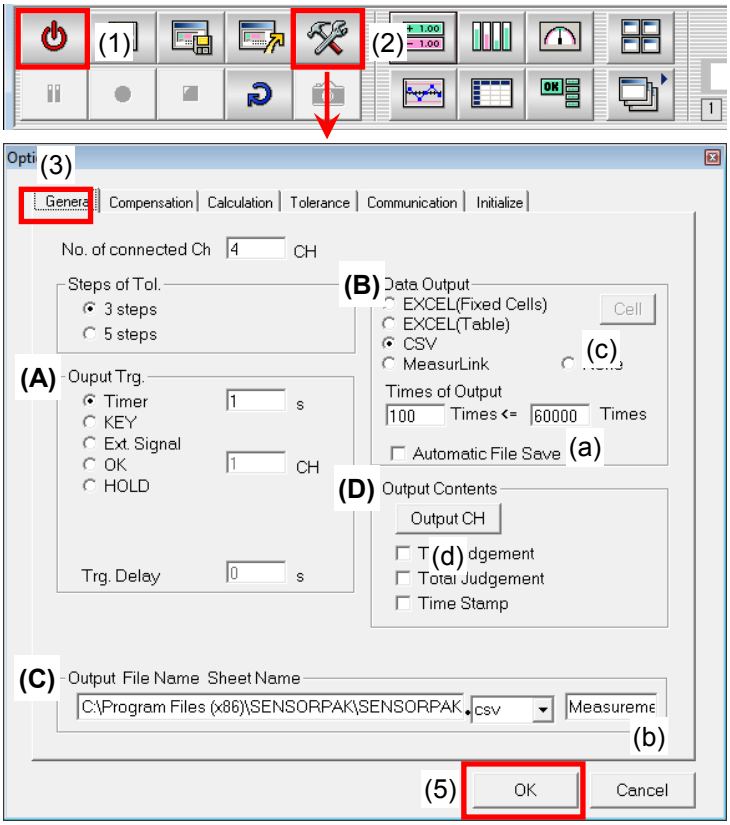
(2) Click the [OK] button to close the Control Panel window.

NOTE The values set here are initially enabled when the Online mode is entered (the [Monitoring ON/OFF] button is turned green). After setting the values, do not fail to enter the Online mode once. If the software is quit without entering the Online mode, the set values will be cleared.

3.3.2 Data Logging and output functions

Display data is logged in the internal memory by trigger signals from, for example the key or timer.
Data that has been logged can be displayed in a Table or Chart during data logging.
It is also possible to output logged data to the Excel spreadsheet and CSV file.

3.3.2.1 Setting with the option window



(1) Click on the [Monitoring ON/OFF] button to turn OFF the monitoring mode.

(2) Click on the [Option] button to open the Option Panel.

(3) Click on the [General] tab.

(4) Performing the output settings.

(5) Click on the [OK] button to close the Option Panel.

Output settings

➢ **Output trigger**

Timer:	Logging is performed at a specific time interval (0.01 s through 9999 s).
KEY:	Logging is performed with the one-shot button.
External signal:	Logging is performed with the input of the external TRG signal to the I/O cable (option).
OK:	Logging is performed with the change of the state of the specified channel from NG to OK. (Default channel is channel 1.)
HOLD:	Logging is performed with the HOLD signal input to the I/O connector of the counter. (Except for the EF counter)
Trg.Delay:	Pauses after the input of the trigger signal for the elimination of the vibration caused immediately after contact between the gage spindle and the work piece. (Range: 0.1 s to 60 s).

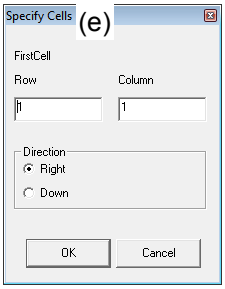
NOTE Data logging may not take place according to the time interval set, depending on the number of channels connected.
Data logging in such a case will be made at an appropriate time interval, with the cycle indicator value being the minimum time interval available for data logging.

External signals are not available if an I/O cable is not used.

➢ **Data output**

EXCEL (Fixed Cell): Writes in the cell of the spreadsheet in real-time.
EXCEL (Table): Writes in the same cell of the spreadsheet.
CSV format: Saves in the CSV format.
MeasurLink: Saves in the CSV format compatible with the MeasurLink.
Number of output: Specifies the frequency of data intake.
Refer to the displayed frequency on the (a).

TIP In the EXCEL (Fixed Cell) mode, it is possible to select the logging direction (line or row) and specify the starting cell by the [cell] button.
Right = Column direction, Down = Row direction



NOTE With the MeasurLink compatible mode, it is only possible to output consecutive data: ch1 through chn. Output is not available for timestamp, tolerance judgment, total judgment, and calculation between channels.

➢ **Output File Name**

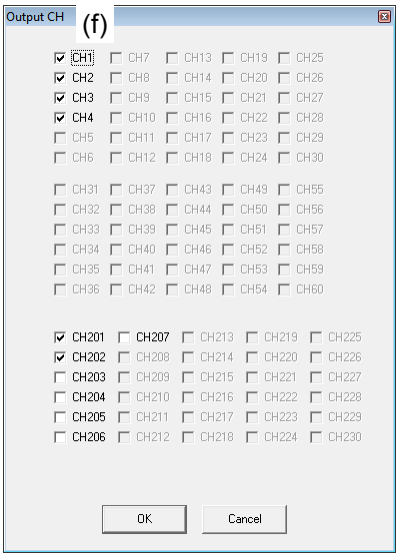
Specifies the filename of the Excel spreadsheet or the CSV file into which data is automatically saved.
Enter the sheet name in the frame (b) if using the Excel spreadsheet.

➢ **Output Contents**

It is possible to exclude an unoccupied channel from the log and include the tolerance judgment and time stamp in the output data.

Selection of the output channels

Click on the [Output CH] to open the Output CH panel (f).
Check the channels from which to obtain the output.
CH1 - CH60; Gage channels
CH201 - CH230; Calculation channels
Checked: Performs data logging and output with the channel checked. (Default)
Not checked: Excluded from the target channels of data logging and output.
Unoccupied channels are grayed out and cannot be set up.



3.3.2.2 Output format

➢ In the case of 3-step tolerance:

	Time Stamp	Total OK/NG	Block1 OK/NG	Block2 OK/NG	Block3 OK/NG	Block4 OK/NG	Ch1 Data	Ch1 OK/NG	Ch2 Data	Ch2 OK/NG	·····
1	10:12:23,	OK,	OK,	OK,	OK,	OK,	0.00457,	OK,	-12.0056,	OK,	·····
2	10:20:50,	NG,	NG,	OK,	OK,	OK,	-0.2367,	-NG,	20.0058,	+NG,	·····

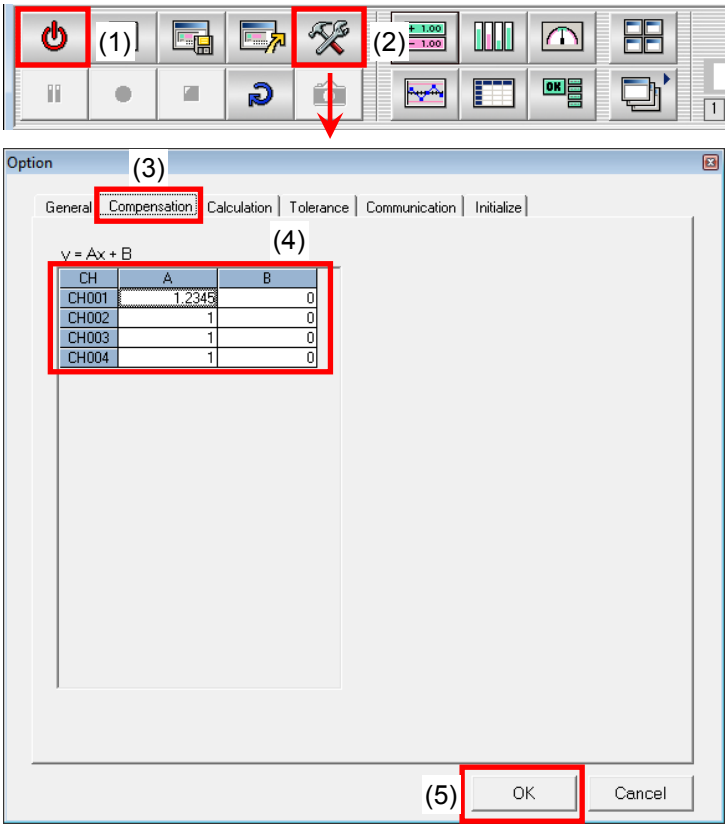
➢ In the case of 5-step tolerance:

	Time Stamp	Total OK/NG	Block1 OK/NG	Block2 OK/NG	Block3 OK/NG	Block4 OK/NG	Ch1 Data	Ch1 OK/NG	Ch2 Data	Ch2 OK/NG	·····
1	10:12:23,	OK,	OK,	OK,	OK,	OK,	0.00457,	S3,	-12.0056,	S3,	·····
2	10:20:50,	NG,	NG,	OK,	OK,	OK,	-0.2367,	S1,	20.0058,	S4,	·····

TIP Unnecessary items can be excluded from the selection of output contents.
Each item is separated by a comma ",".

3.3.3 Linear Compensation Function

Linear compensation can be applied to input data for each channel.



(1) Click on the [Monitoring ON/OFF] button to turn OFF the monitoring mode.

(2) Click on the [Option] button to open the Option Panel.

(3) Click on the [Compensation] tab.

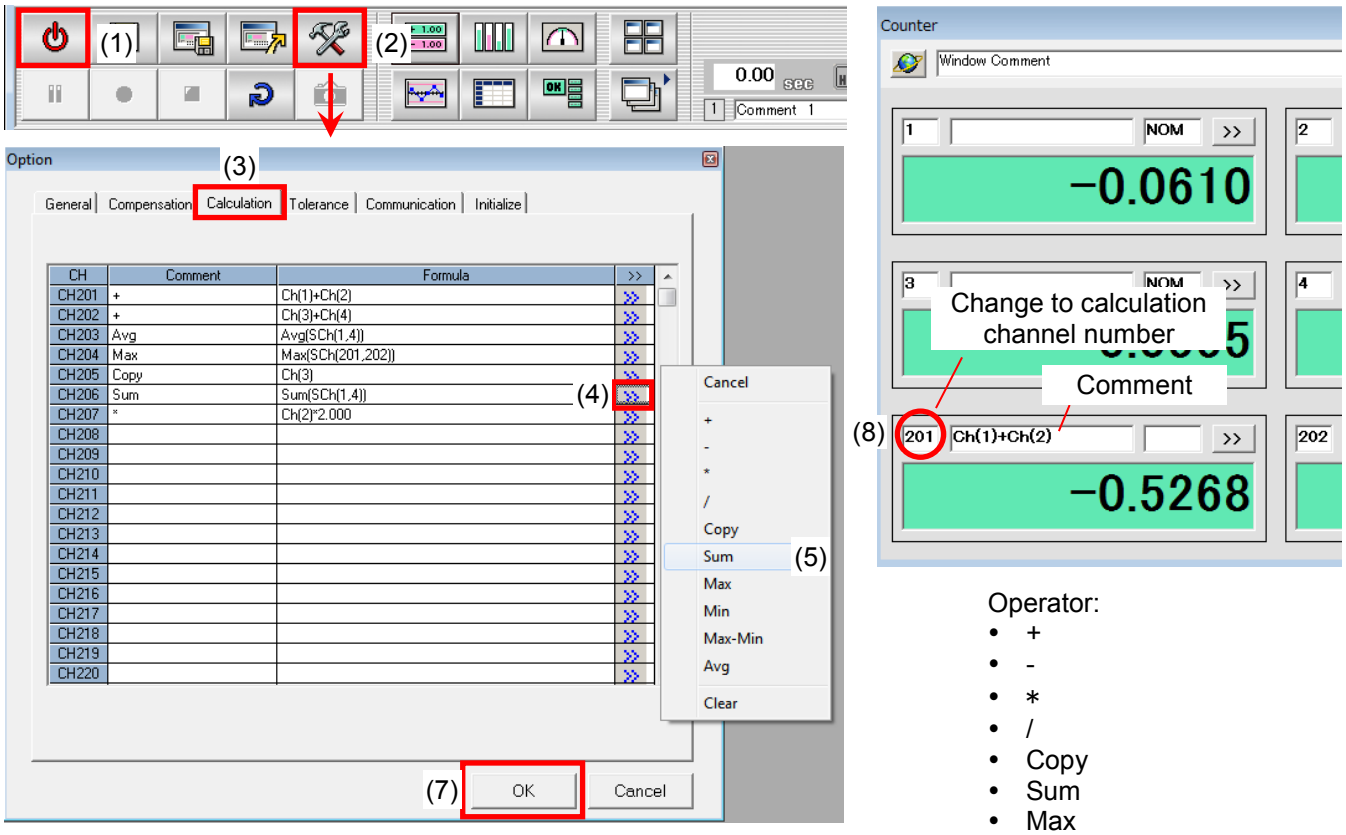
(4) Enter the compensation value for each channel.

A: slope
B: intercept

(5) Click on the [OK] button to close the Option Panel.

3.3.4 Calculation Function Between Channels

Calculation between selected channels can be performed to display measurements such as thickness, step, etc. Up to 30 calculation channels can be set for the calculation results to be displayed in the assigned channels (similarly to the display of the measurement data).



Operator:

- +
- -
- *
- /
- Copy
- Sum
- Max
- Min
- Max-Min
- Avg

(1) Click on the [Monitoring ON/OFF] button to turn OFF the monitoring mode.
(2) Click on the [Option] button to open the Option Panel.
(3) Click on the [Calculation] tab.
(4) Open the calculation menu list of each channel with the POP button [>>]
(5) Select the desired operator from the calculation menu and right-click on it. A formula is entered in the relevant cell.
(6) Change the text "#" of a formula, into the channel number to calculate.

Select the text "#" with the cursor, input the channel number to calculate.

Calculation channels can also be included in elements in addition to the measurement channels. However, only those that have been defined can be included.

Consecutive channels "Ch(1) - Ch(4)", for example: can be specified as "Sh(1,4)".
Substitute the constant with a numerical value for calculation with the constant. example: Ch(2)*2.000

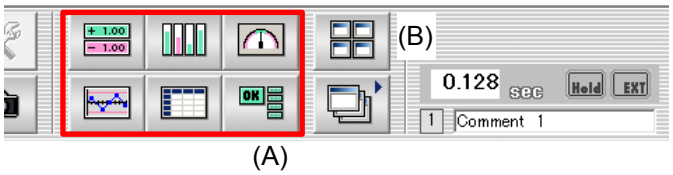
(7) Click on the [OK] button to close the Option Panel.
(8) Change the channel number of the Display unit to the defined channel number. A comment can be appended to the calculation as required.

NOTE Calculations between channels can only be performed on data of the same resolution.

3.4 Laying-out Windows

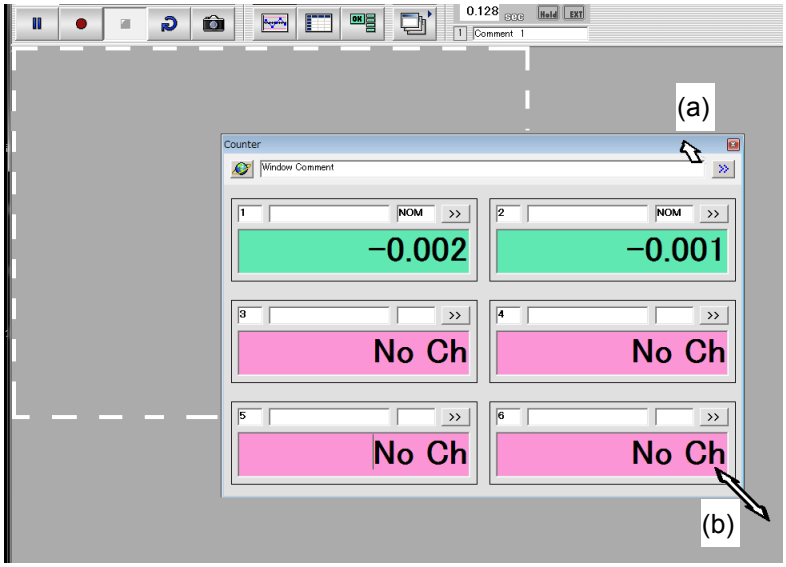
Various windows can be added into the display space by clicking the window operation buttons on the toolbar. There are also the button to lay out and display windows and the button to store or call up a layout.

3.4.1 Adding, moving or sizing windows



(A)

(A) Addition of various windows
(B) Display of arranged windows



Moving a window
(1) Move the mouse pointer to the window title bar (a).
(2) Move the mouse while holding down the mouse right button.

Enlarging a window
(1) Move the mouse pointer to the window edge (b) to change the pointer shape.
(2) Move the mouse while holding down the mouse right button.

3.4.2 Saving and Recall of Display Layout

Up to nine display layouts can be saved and switched with one-touch operation. This allows tolerance limits of various work pieces to be set according to the type.

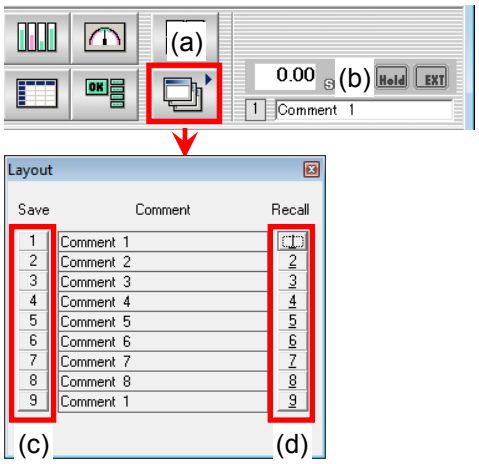
3.4.2.1 Saving the layouts

(1) Input the arbitrary layout comment. (b)
(2) Click on the [Layout Save & Recall] button (a) to open the Layout Panel.
(3) Click on the [Save] button (c) of a number to save.

3.4.2.2 Recalling the layouts

(1) Click on the [Layout Save & Recall] button (a) to open the Layout Panel.
(2) Click on the [Recall] button (d) of a number to display.

The initial screen will be returned to if no layout has been saved.



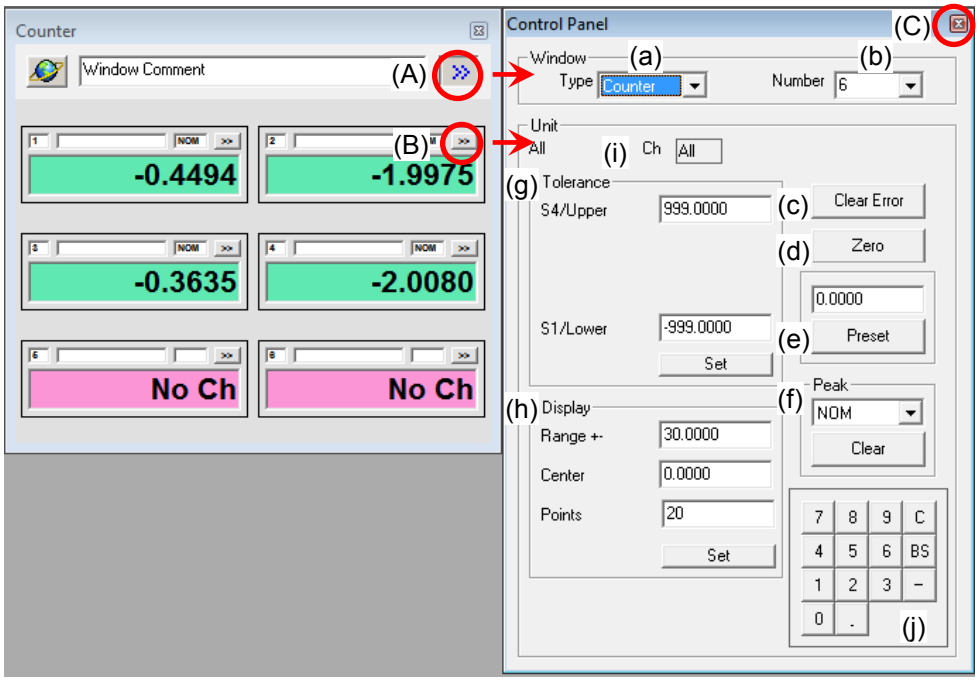
3.5 Setting a Window in Detail

Change settings in a Display window from the Control Panel window.
You can use either of the two setting methods; one is to set all channels in the Display window at once and the other is to set one at a time.

3.5.1 Control Panel

(1)Click on the POP button [>>] ((A), (B)) of the Display window to open the Control Panel window.
Button (A) : Setting the channels all at once with in the Display window.
Button (B) : Setting the channels one-by-one with in the Display window.

(2)Click on the [x] button (C) to close the Control Panel window.



➢ Window setting

(a) Type: Switches the display mode between the Counter, Bar Graph, and Meter.
(b) Number: Sets the number of the units to be displayed on the Display window.

It is not displayed in the Logging window (Chart).

➢ Unit setting

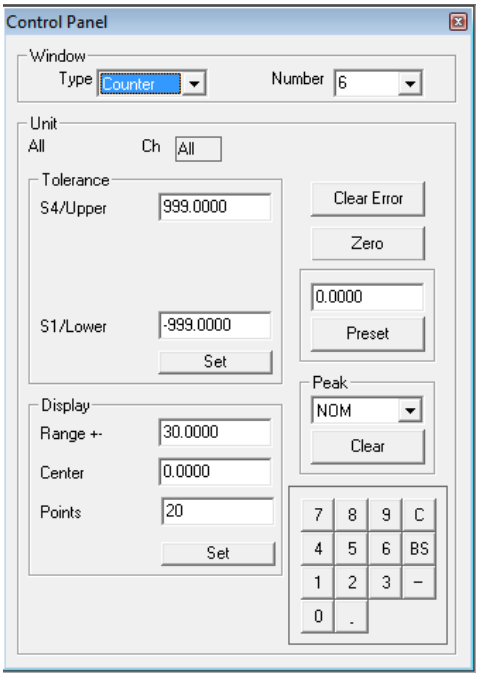
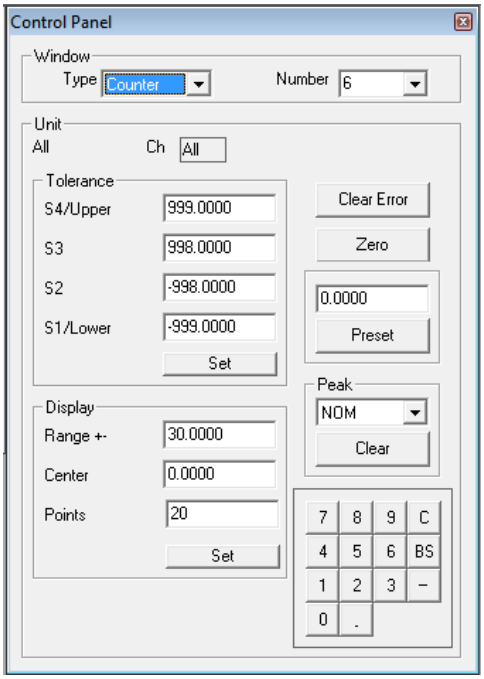
(c) Clear Error: Cancels the error and sends the cancel command to the counter as well.
(d) Zero: Executes zero-set and sends the zero-set command to the counter as well.
(e) Preset: Presets a value and sends the preset command to the counter as well.
(f) Peak: Changes the peak measurement mode of the counter.
The Clear button clears the peak value.
(g) Tolerance: Sets 3 or 5 step tolerance values and sends the tolerance values to the counter as well.

(h) Display: Sets the range and center value of the graph in the Bar Graph, Meter, and chart display modes.
(i) Ch.[ ]: Displays the target channel number.
All channels set in the Display window will be the target when “All” is indicated here.

(j) Ten-key: Used for entering numerical values.

3.5.2 tolerance setting

For tolerance judgment, tolerance of 3/5 steps can be set. (Refer to 3.3.1 "Tolerance determination function")
The following describes how to set the tolerance value using the control panel.

<table>
<tr><th></th><th>3-step tolerance</th><th>5-step tolerance</th></tr>
<tr><td>Appearance of control panel</td><td> 
</td><td> 
</td></tr>
<tr><td rowspan="2">Operation explanation</td><td>Enter the lower tolerance limit for S1/Lower.
Enter the upper tolerance limit for S4/Upper.</td><td>Enter the lower tolerance limit for S1/Lower.
Enter the tolerance for S2.
Enter the tolerance for S3.
Enter the upper tolerance limit for S4/Upper.</td></tr>
<tr><td colspan="2">Click on the [Set] button to complete the setting, and transmit the set values to the counter.
Click on the [x] button of the Control Panel to close the panel.</td></tr>
<tr><td rowspan="2">Setting condition</td><td colspan="2">The tolerance limit values should have the following relationship.
Otherwise, an error will result.</td></tr>
<tr><td>S1/Lower ≦ S4/Upper</td><td>S1/Lower ＜ S2 ＜ S3 ＜ S4/Upper
or
S1/Lower ＝ S2 ＝ S3 ＝ S4/Upper</td></tr>
</table>

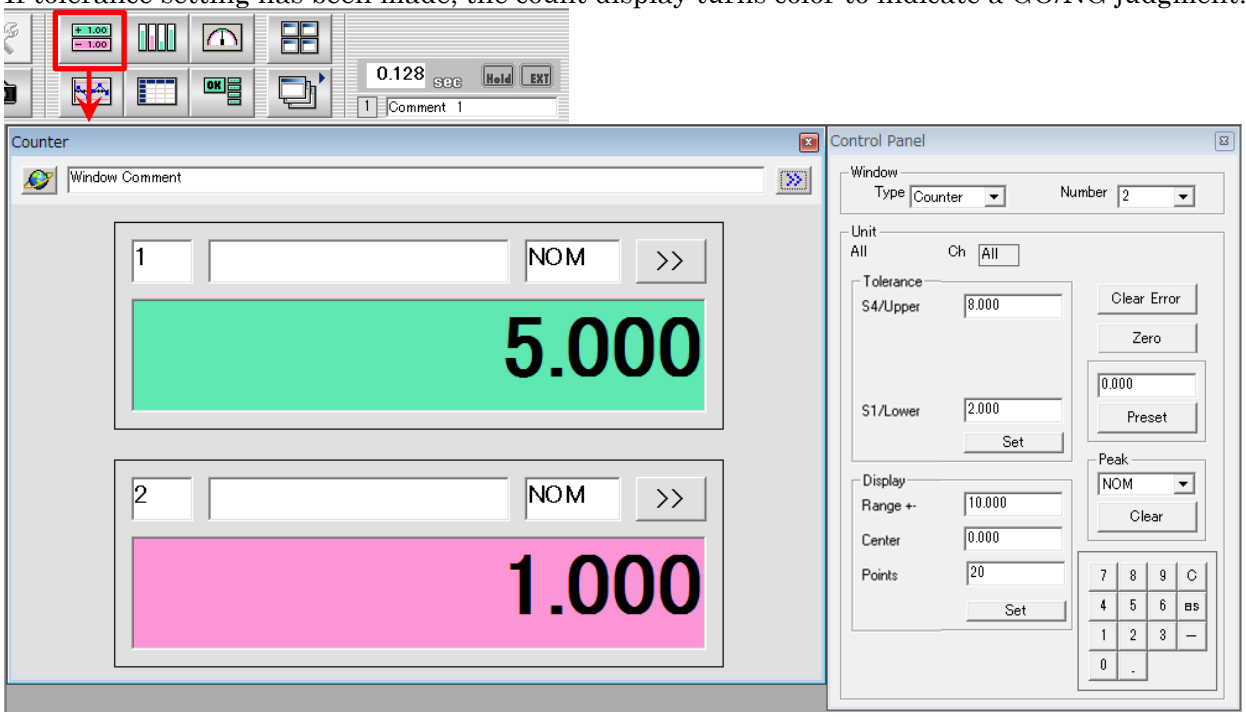
3-step tolerance judgment result	5-step tolerance judgment result	Display
Measurement < S1/Lower	Measurement < S1/Lower	Red
———	S1/Lower <= Measurement < S2	Yellow
S1/Lower <= Measurement <= S4/Upper	S2 <= Measurement <= S3	Green
———	S3 < Measurement <= S4/Upper	Yellow
S4/Upper < Measurement	S4/Upper < Measurement	Red

NOTE In order to conform the setting values of SENSORPAK to those of the counter, you need to put the counter into the online state. Change settings during online or restore online once if you perform setting offline, then the change of settings becomes enabled.
In the online state, tolerance limit settings are transmitted to the counter and the counter settings are also changed.

3.5.3 Display window

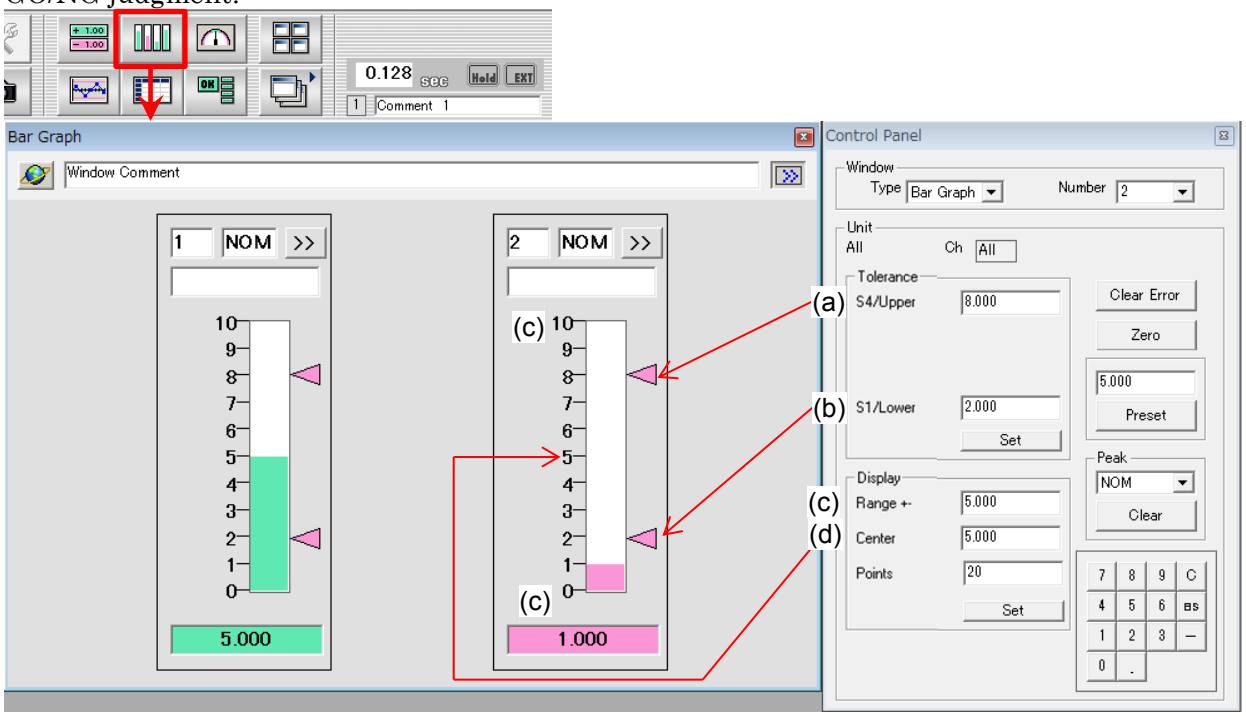
3.5.3.1 Counting form

The count data of each channel is displayed with a numeral.
If tolerance setting has been made, the count display turns color to indicate a GO/NG judgment.



3.5.3.2 Bar graph form

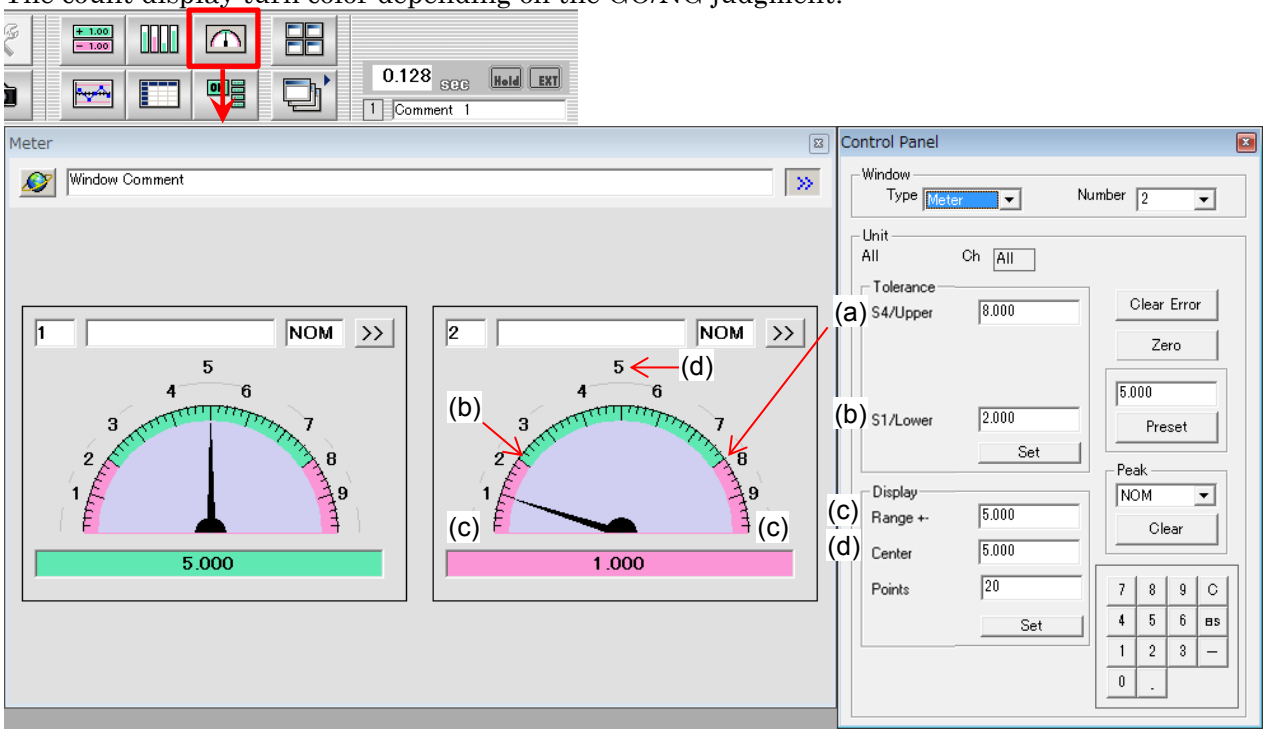
The count data of each channel is displayed with a vertical bar. The scale is fixed with it divided into 10 graduations.
If tolerance setting has been made, triangular symbols are displayed on the right of a bar to indicate a tolerance range. Additionally, the count display and bar turn color depending on the GO/NG judgment.



Display explanation
Range: Sets the display range of the vertical axis.
Center: Sets the center value of the vertical axis.
(No. of points): Not used in the bar graph form.

3.5.3.3 Meter form

A measurement value in each channel is represented by pointing one of the graduations laid out in a semicircle shape with the pointer. The scale is fixed with it divided into 50 graduations.
If tolerance setting has been made, a section of the scale turns color to indicate a tolerance range. The count display turn color depending on the GO/NG judgment.



Display explanation
Range: Sets the range (upper and lower limit) from the center of the scale.
Center: Sets the center value of the scale.
(No. of points): Not used in the meter form.

TIP

Calculating an indicated value per graduation
1 graduation = range (c) × 2/number of divisions
Example; Setting the range when 1 graduation is assumed as 0.01mm
Range = 1 graduation × number of divisions/2
= 0.01 × 50/2
= 0.25
When the range is set as 0.25, 1 graduation becomes 0.01mm.

NOTE

The maximum number of numerical display digits shall conform to the number of integer part digits + the number of decimal part digits ≦ 7 digits.

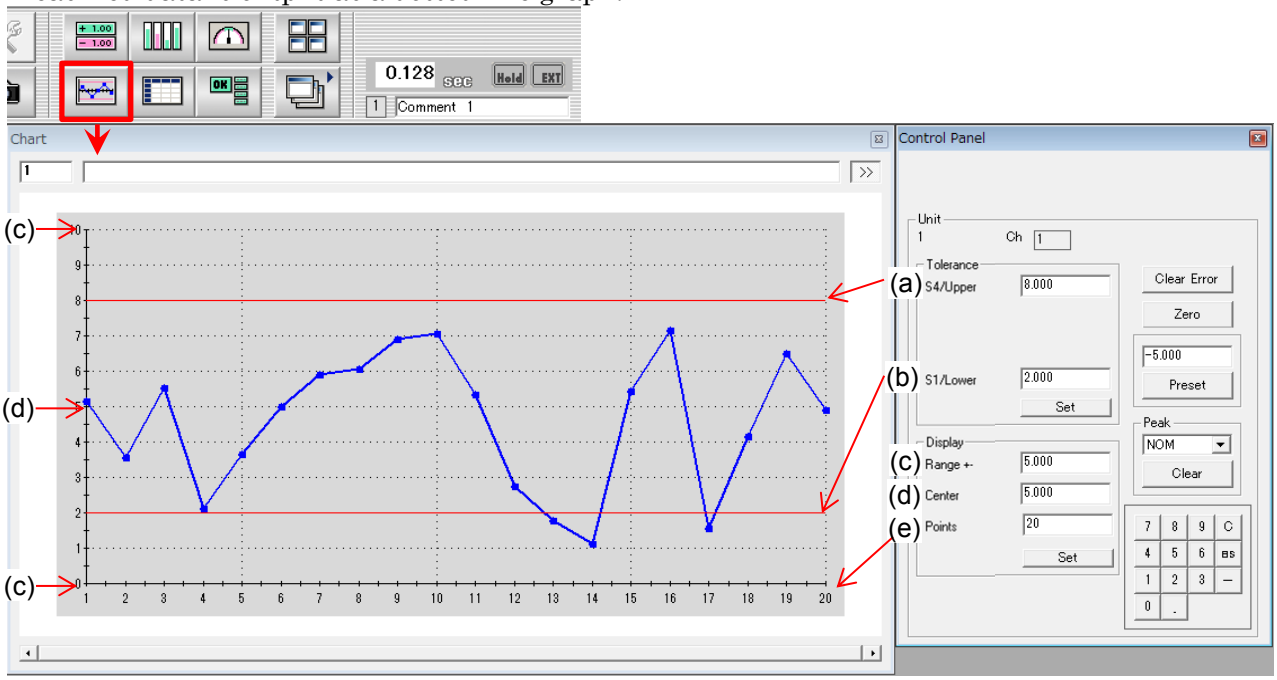
Example:
10.000005 is undisplayable. (3 digits of integer part + 5 digits of decimal part = 8 digits)

If the display range is set as 0.000025 and the center value is as 10, you cannot obtain normal display.
Properly reset the display range.

3.5.4 Log window

3.5.4.1 Chart form

Measured data is output as a dotted line graph.



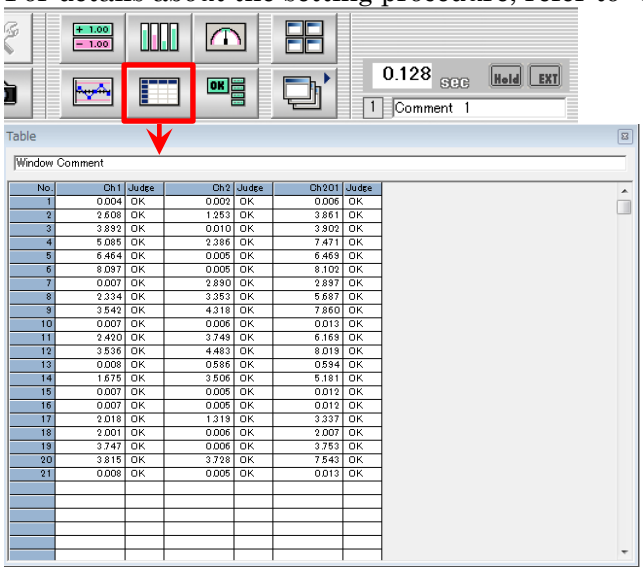
Display explanation
Range: Sets the display range of the vertical axis.
Center: Sets the center value of the vertical axis.
No. of points: Sets the number of display data on the horizontal axis.

TIP

- With the chart display, one display window is assigned to each channel. Open multiple windows for the display of multiple channels.
- Changes in the setup of the display will be reflected in the chart at the time of starting the log.
- The tolerance width is indicated by colored lines for the channel set-up with the tolerances.

3.5.4.2 Table form

Measured data is output as a table. Data to be displayed is arbitrary and changeable.
For details about the setting procedure, refer to "3.3.2 Data record and output functions"

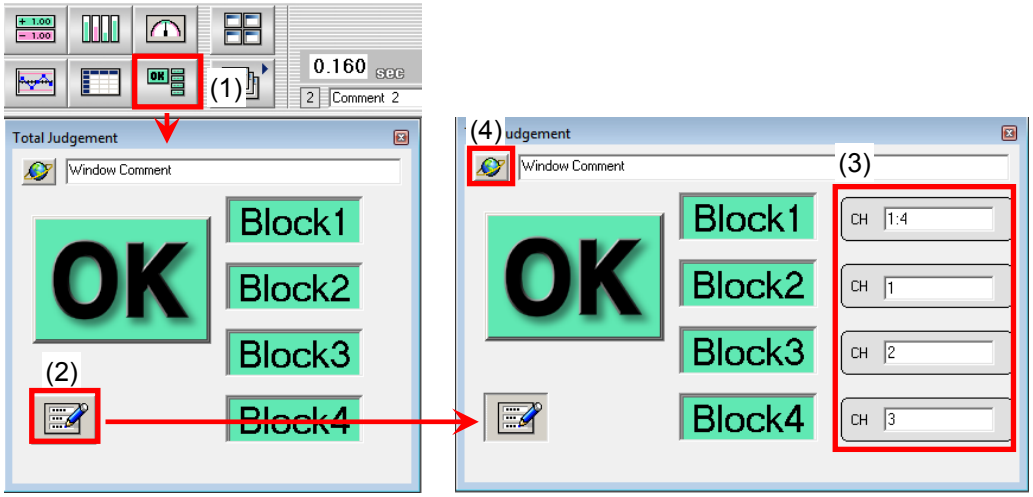


No.	Ch1	Judge	Ch2	Judge	Ch201	Judge
1	0.004	OK	0.002	OK	0.006	OK
2	2.608	OK	1.253	OK	3.861	OK
3	3.892	OK	0.010	OK	3.902	OK
4	5.085	OK	2.386	OK	7.471	OK
5	6.464	OK	0.005	OK	6.468	OK
6	8.097	OK	0.005	OK	8.102	OK
7	0.007	OK	2.890	OK	2.897	OK
8	2.334	OK	3.353	OK	5.687	OK
9	3.542	OK	4.318	OK	7.860	OK
10	0.007	OK	0.006	OK	0.013	OK
11	2.420	OK	3.749	OK	6.169	OK
12	3.536	OK	4.483	OK	8.019	OK
13	0.008	OK	0.586	OK	0.594	OK
14	1.675	OK	3.506	OK	5.181	OK
15	0.007	OK	0.005	OK	0.012	OK
16	0.007	OK	0.005	OK	0.012	OK
17	2.018	OK	1.319	OK	3.337	OK
18	2.001	OK	0.006	OK	2.007	OK
19	3.747	OK	0.006	OK	3.753	OK
20	3.815	OK	3.728	OK	7.543	OK
21	0.008	OK	0.005	OK	0.013	OK

3.5.5 Total Tolerance Judgment

A total tolerance judgment can be made with the AND operator on all channels. It is also possible to specify channels to be included in the total judgment.

3.5.6 Specifying the channel to be judged



(1) Open the Total judgment window by clicking the [Total judgment window] button.
(2) Open the setting window with the [Setting] button.
(3) Enter the channel number to be included in the total judgment.

How to specify:

For consecutive channels to be included, from channel 1 to channel 10 for example, enter 1:10.
For intermittent channels to be specified, enter channel numbers in four blocks 1 through 4 as appropriate.
Total judgment will be made with the AND operator on all channels specified.

(4) Click on the [Trigger HOLD] button to hold the display.
The mode display changes cyclically as shown below:

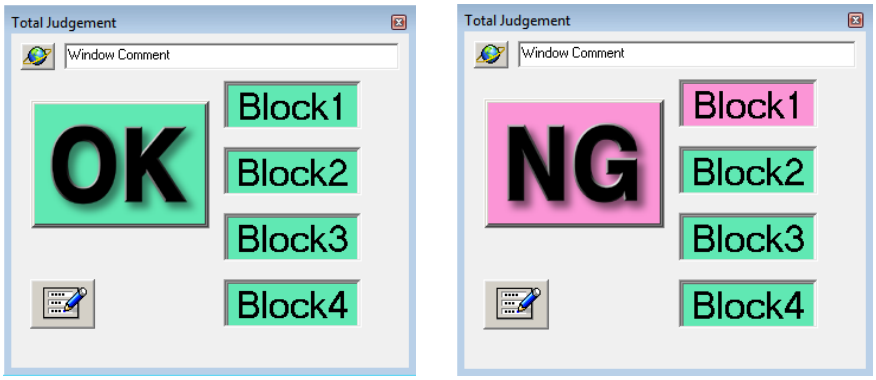
(A) Live Mode
Always display the tolerance judgment result

(B) Hold Mode
Displays the tolerance judgment result each time the trigger signal is input

3.5.7 Total Tolerance judgment example

Total tolerance judgment “OK” will be displayed only if all channels are judged OK. If any of the channels resulted in NG, the total tolerance judgment will be “NG”. Channels subject to total tolerance judgment can be set separately in four blocks and judgment can be made on each block. This facilitates identification of the block that was NG when the total tolerance judgment resulted in “NG”.

In the case of 5-step tolerance, the judgments L2, L3, and L4 are judged as “OK”.

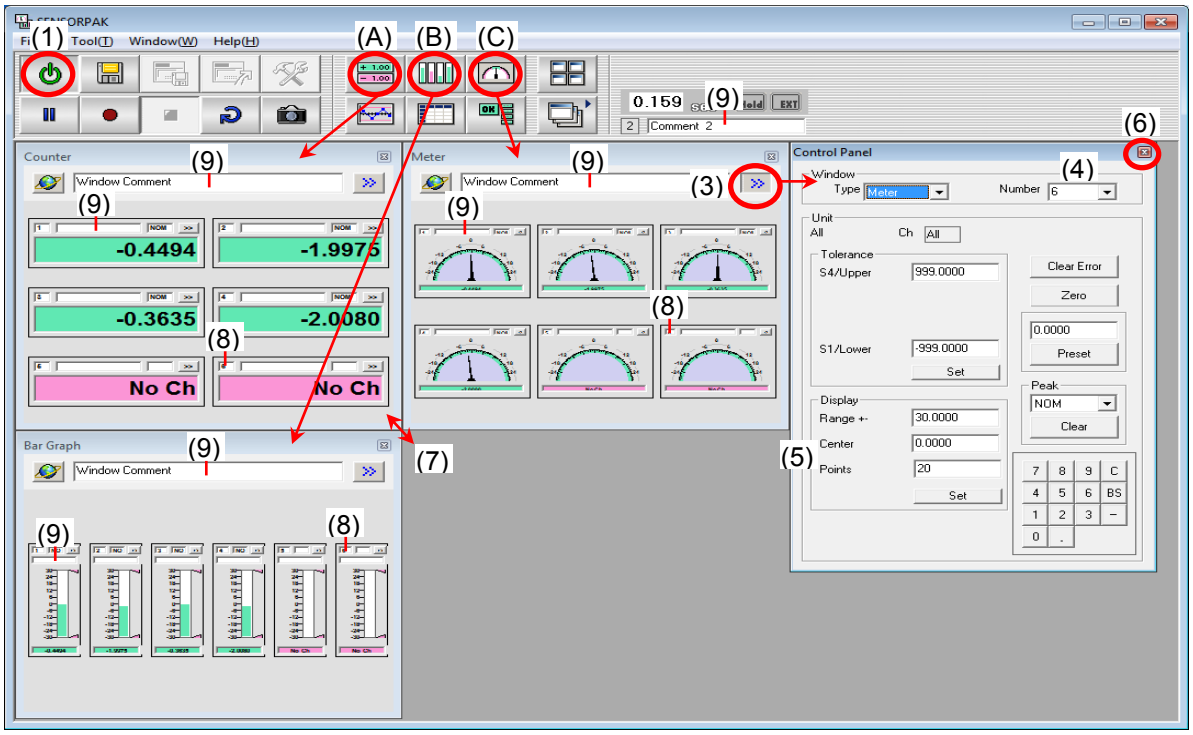


MEMO

4 How to Operations

Chapter 3 Measurement Preparation describes the setting procedures until measurement. This chapter describes operations during the Online mode.

4.1 Display Screen Operation



(1) Turn on the monitoring mode (on-line state) with the [Monitoring ON/OFF] button, which turns red in monitoring off or green in monitoring mode.
(2) Click on the desired [Display window] button ((A): Counter, (B): Bar Graph, or (C): Meter) as required to open a new window.
(3) The Control Panel is opened if the POP button [>>] of the new window is clicked on.
(4) Set the number of channels on the Control Panel.
(5) Set the display range and the center value on the Control Panel if the bar graph and meter have been selected.

Range: Default value of the display range is -30.000 to +30.000 for the Bar Graph/Meter.
Center: Default value of the center is 0.000 at the center of the Bar Graph/Meter.
Points: Only set when using the Chart. Specify the number 1 or more.
Numerical data should be entered using one byte characters.

(6) Click on the [x] button to close the Control Panel.
(7) Drag the mouse to the desired size of the Display window.
(8) Set a channel number to be displayed for each Display unit.
(9) A comment can be appended as desired (to each layout, display window, and display unit.).

TIP

- Multiple windows that have been opened can be arranged with the window arrange button.
- Up to nine layouts that have been created can be saved and recalled with one-touch operation.

A maximum of 12 windows can be included in each layout with the following conditions: nine display windows + logging display windows + charts + total tolerance windows. Furthermore, up to 4 windows each are available for the counter, bar graph, and meter within one layout.

NOTE

If the display gradation is not updated according to the change made on the bar graph and meter, re-draw the display window by changing the window size or by means of the window arrange button.
Or, save the layout after it is retrieved again.
(Refer to Section 4.9 “Saving and Recall of Display Layout”.)

The display change will be updated at the start of the next logging.

4.2 Counter Control

On-screen zero-setting, presetting, tolerance setting, etc., of the counter is possible with SENSORPAK.

NOTE To ensure that the settings of SENSORPAK agree with those of the counter, such settings should be made online.
Color of the [Monitoring ON/OFF] button; RED: on-line, GREEN: off-line

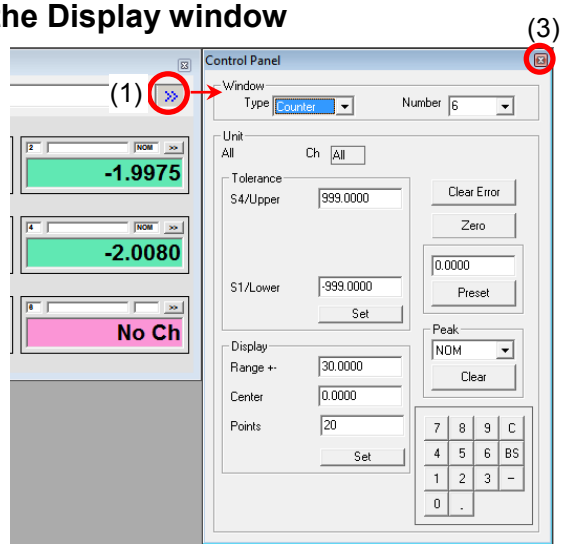
TIP Zero, preset value, and peak mode will also be transmitted to the counter, simultaneously changing the settings of the counter.

4.2.1 Setting the channels all at once within the Display window

(1) Click on the POP button [>>] on the Display window to open the Control Panel.

(2) Select a desired function button with the mouse, then left-click on the button to execute the function. (Refer to Section 3.3 “Control Panel”.)

(3) Click on the [x] button to close the Control Panel.

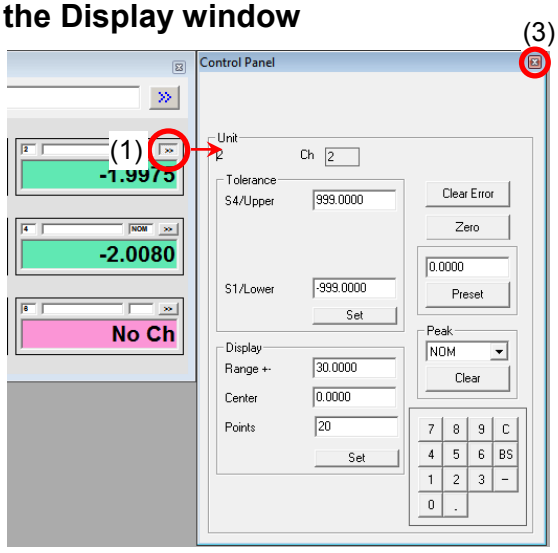


4.2.2 Setting the channels one-by-one within the Display window

(1) Click on the POP button [>>] on the Display unit to open the Control Panel.

(2) Select a desired function button with the mouse, then left-click on the button to execute the function. (Refer to Section 3.3 “Control Panel”.)

(3) Click on the [x] button to close the Control Panel.

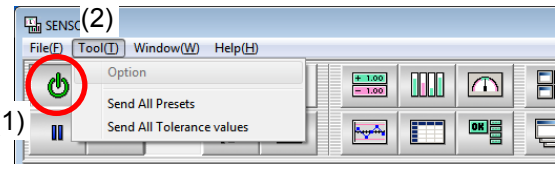


4.2.3 How to transmit Preset and Tolerance to all the counters

(1) Click on the [Monitoring ON/OFF] button to turn ON the monitoring mode.

(2) Turn the system online and execute each of the functions [Send All Presets] and [Send All Tolerance values] from the Tool menu.

Peak mode setting can be performed for the [Send All Tolerance values]



4.3 Log window operation

4.3.1 Logging Start/Stop

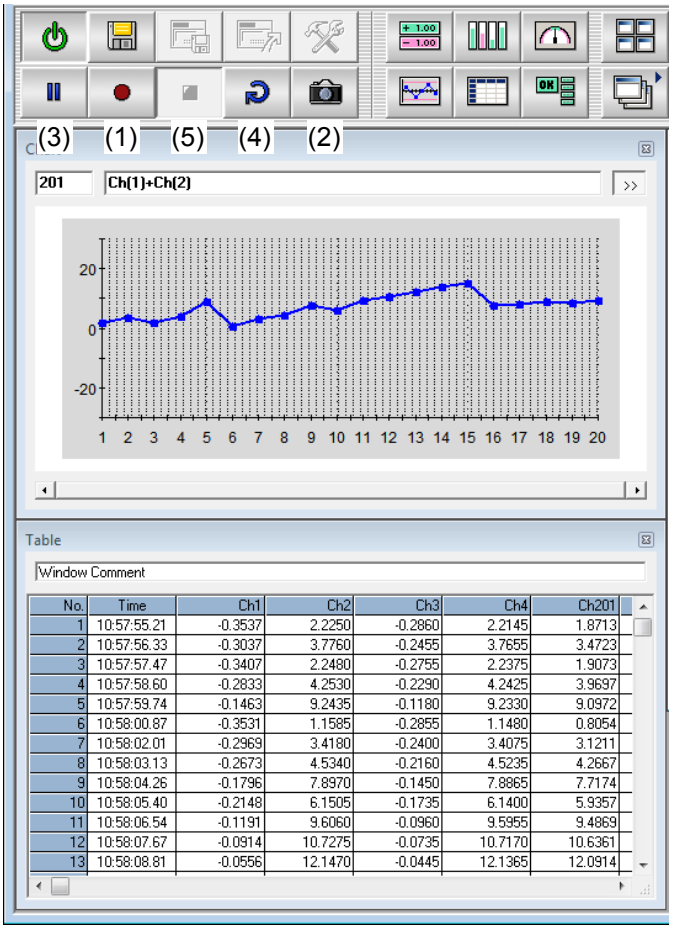
(1) Click on the [Logging Start] button to start data logging with the given trigger conditions.

(2) In the case of “Output trigger (Option Panel) = KEY”:
Click on the [One-shot] button while in the logging mode to log the display data at that time.

(3) Data logging is paused with the [Pause] button.

(4) Data cancellation is possible for the last piece of logged data by clicking on the [Cancel] button while in the pause state.

(5) Logging is terminated by clicking on the [Logging Stop] button.



No.	Time	Ch1	Ch2	Ch3	Ch4	Ch201
1	10:57:55.21	-0.3537	2.2250	-0.2860	2.2145	1.8713
2	10:57:56.33	-0.3037	3.7760	-0.2455	3.7655	3.4723
3	10:57:57.47	-0.3407	2.2480	-0.2755	2.2375	1.9073
4	10:57:58.60	-0.2833	4.2530	-0.2290	4.2425	3.9697
5	10:57:59.74	-0.1463	9.2435	-0.1180	9.2330	9.0972
6	10:58:00.87	-0.3531	1.1585	-0.2855	1.1480	0.8054
7	10:58:02.01	-0.2969	3.4180	-0.2400	3.4075	3.1211
8	10:58:03.13	-0.2673	4.5340	-0.2160	4.5235	4.2667
9	10:58:04.26	-0.1796	7.8970	-0.1450	7.8865	7.7174
10	10:58:05.40	-0.2148	6.1505	-0.1735	6.1400	5.9357
11	10:58:06.54	-0.1191	9.6060	-0.0960	9.5955	9.4869
12	10:58:07.67	-0.0914	10.7275	-0.0735	10.7170	10.6361
13	10:58:08.81	-0.0556	12.1470	-0.0445	12.1365	12.0914

TIP

- Starting logging clears the data logged previously.
- CSV files cannot be saved during logging. Save the CSV files after logging is over.
- Cancellation of the last piece of logged data is not possible after logging is over.

4.3.2 Logged data output to the Excel spreadsheet

When data logging starts, an Excel spreadsheet file automatically opens to log data.
Data output is made to the “Filename”.
Filename: Refer to Section 4.5.1 “Setting with the option window” - (C) Output File Name.
A file is automatically created if there is no file there.

➢ EXCEL (Table)

	A	B	C	D	E
1	No	Ch1	Ch2	Ch3	Ch4
2	1	0.3120	2.8308	0.2990	2.7705
3	2	0.3110	2.9258	0.2980	2.8655
4	3	0.4385	4.0589	0.4255	3.9986
5	4	0.3815	3.5110	0.3685	3.4507
6	5	0.2400	2.1488	0.2270	2.0885
7	6	0.2745	2.4618	0.2615	2.4015
8	7	0.4145	3.8556	0.4015	3.7953
9	8	0.4140	3.8384	0.4010	3.7781
10	9	0.3960	3.5443	0.3830	3.4840
11	10	0.3390	3.1716	0.3260	3.1113

Measurement

The line feeds each time.

➢ EXCEL (Fixed Cell)

Right = Column direction

	A	B	C	D	E
1	No	Ch1	Ch2	Ch3	Ch4
2	12	0.3120	2.8308	0.2990	2.7705
3					
4					
5					
6					
7					
8					
9					
10					
11					

Measurement

Over writes the identical cell.

Down = Row direction

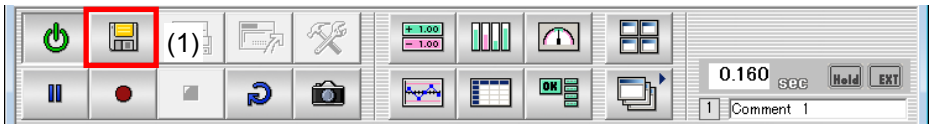
	A	B	C	D	E
1	No	12			
2	Ch1	0.3120			
3	Ch2	2.8308			
4	Ch3	0.2990			
5	Ch4	2.7705			
6					
7					
8					
9					
10					
11					

Measurement

NOTE

- Perform no Excel spreadsheet operations other than manipulating the scroll bar during output.
- If logging data at a short time interval, an output error alarm from the Excel spreadsheet may result during a pause in data logging. In this case, however, data logging is taking place normally.

4.3.3 Logged data save to the CSV file



(1) The dialog box opens with the [Save measurement data] button.
(2) Enter the file name and save the data.

4.3.4 Automatic File Save

If auto-save with the CSV file has been specified, automatic saving of the file takes place if the number of output times set on the Option Panel has been reached.

- **"CSV"** option button: Checked "ON"
- **"Automatic File Save"** Check button: Checked "ON"

An output file is automatically created for the specified filename with the automatically assigned consecutive numbers.

Example:

Filename: TEST.CSV
TEST_001.CSV
TEST_002.CSV
TEST_003.CSV

4.4 Holding the Display window with the Trigger Signal

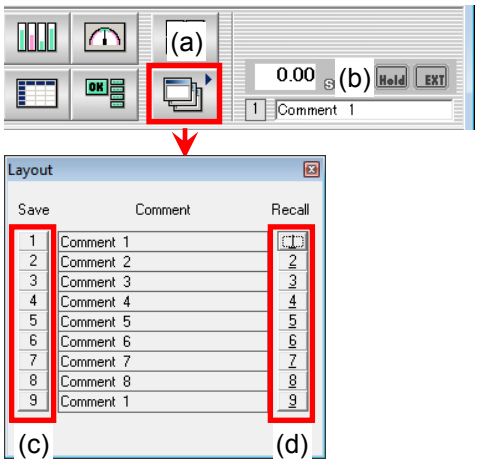
Each Display unit of the Display window normally displays data in real time - "(A) Live mode".
Clicking on the [Trigger Hold] button (a) of the Display window activates the "(B) Hold mode", in which the display updates the data each time the trigger signal is input and retains it until the next trigger signal.
Clicking on the button again in the hold mode restores the "(A) Live mode".

(A) Live mode ⟷ (B) Hold mode

4.5 Saving and Recall of Display Layout

Up to nine display layouts can be saved and switched with one-touch operation. This allows tolerance limits of various work pieces to be set according to the type.

4.5.1 Saving the layouts



(1) Input the arbitrary layout comment. (b)
(2) Click on the [Layout Save & Recall] button (a) to open the Layout Panel.
(3) Click on the [Save] button (c) of a number to save.

4.5.2 Recalling the layouts

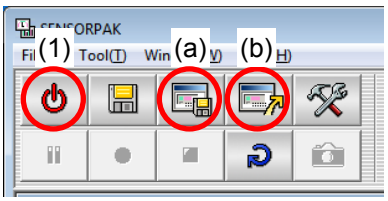
(1) Click on the [Layout Save & Recall] button (a) to open the Layout Panel.
(2) Click on the [Recall] button (d) of a number to display.

The initial screen will be returned to if no layout has been saved.

4.6 Saving and Reading of the Setting file

It is possible to set up the layout of the setup screen and tolerance limits according to the work piece type, when measuring various types of work pieces.

4.6.1 Saving the setting file



(1) Click on the [Monitoring ON/OFF] button to turn OFF the monitoring mode.
(2) The dialog box opens with the [Save setting file] button.
(3) Enter the filename and click on the [Save] button.

4.6.2 Reading the setting file

(1) Click on the [Monitoring ON/OFF] button to turn OFF the monitoring mode.
(2) The dialog box opens with the [Read setting file] button.
(3) Enter the filename and click on the [Open] button.
(4) Transmit Preset and Tolerance to all the counters.
Refer to Section 4.2.3 “How to transmit Preset and Tolerance to all the counters”.

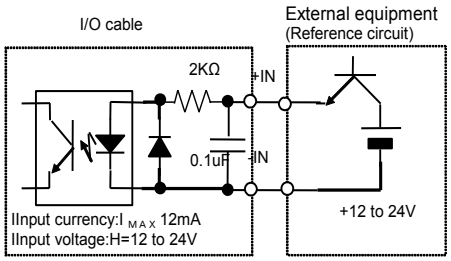
5 External I/O Specification

5.1 I/O circuit

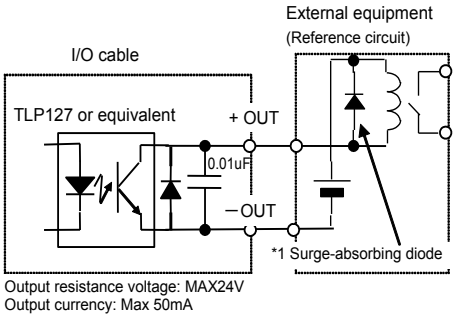
5.1.1 Connection of I/O cable (RS-232C)

When using the I/O cable (02ADL180) to connect between a PC and the counter, the I/O plug provided for that cable is used to handle the two signals of TRG input and total tolerance judgment output.

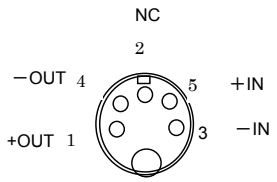
1. TRG input circuit



2. Total tolerance judgment output circuit



3. Pin assignment



Plug cable terminal side

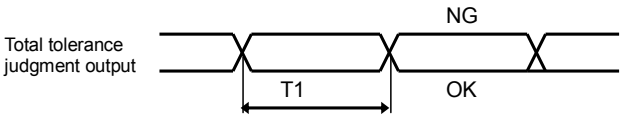
5.1.2 Connection of a USB cable

When connecting a USB cable, the I/O connector on the counter is used to handle the TRG input and the total tolerance judgment output.

For information about the circuitry, refer to the User's Manual of the counter to be connected.

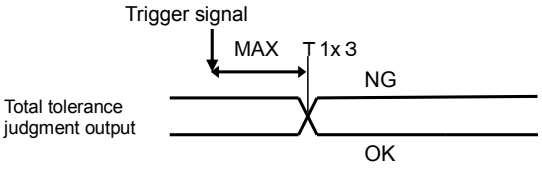
5.2 External I/O timing chart

1. Live output: Outputs OK/NG signals at specified cycle time.



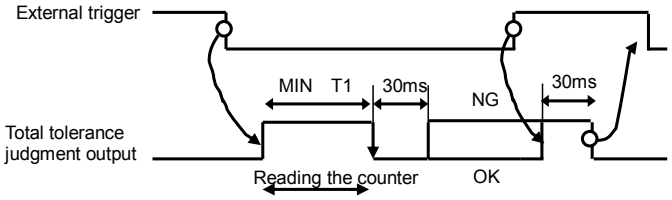
T1: Cycle time (the value displayed on the cycle indicator)

2. Hold output: Outputs OK/NG signals at the input of a trigger signal.



T1: Cycle time (the displayed value of the cycle indicator)
Further delay may result if another process is being performed by the personal computer.

3. Hold output with the external trigger signal (when using an I/O cable).



T1: Cycle time (the value displayed on the cycle indicator)

NOTE Tolerance judgment output will be “L” unless the total tolerance judgment has been set.

6 Troubleshooting

6.1 Error message

Error display	Tolerance Judgment	External OK/NG output	Cause of error	Remedy	Error releasing
Error 15	NG	NG	Instantaneous power failure	Check the counter power unit.	Communication will resume at on/off of the monitor.
Error 20	NG	NG	Over-speed	Check the measurement conditions.	Cancel the error from the control panel.
Error 30	NG	NG	Measurement data is an 8-digit value or more	Change the preset value.	Same as above
Error 40	NG	NG	Gage error	Check the gage connection.	Same as above
Calc Error	NG	NG	Calculation error between channels of different resolutions	Check the calculation formula	Auto release
No Ch	NG	NG	Specification of non-occupied channel	Check the display channel specification.	Auto release
Invalid	NG	NG	Specification of invalid channel	Check the display channel specification.	Auto release
Format Error	NG	NG	Communication from the counter interrupted	Check the communication cable, counter power unit, and the counter mode.	Resume communication after re-setting the transmitting-conditions.
No count value is displayed in the Hold mode.	NG	NG	No initial TRG signal is input in the Hold mode	Input the TRG signal.	Communication will resume at on/off of the monitor.
License-Key Not Found.			License-key is not inserted	Check the license-key	Communication will resume by inserting the license-key in the counter.
Same as above			Unmatched “COM port number”	Check the “COM port number”	Resume communication after re-setting the “Port” of SENSORPAK and PC.
Failed to open the serial port.			No counter power is turned on at USB connection.	Start up the counter.	Communication will resume by turning on/off the monitor.
Runtime error '8012': An internal error caused in the port upon DCB acquisition			Under USB connection, instantaneous counter power failure or power shutdown during online mode	Recheck the counter power supply and do not turn off power during online mode.	Reboot SENSORPAK.

For information about Error XX, also refer to the User's Manual of the counter to be connected.

Error display	Tolerance Judgment	External OK/NG output	Cause of error	Remedy	Error releasing
Unable to Communication with counter			Unmatched RS-232C communication conditions with the counter	Check the RS-232C communication conditions.	Resume communication after re-setting the transmitting-conditions.
Number of Tol. steps are mismatch between PC and counters.			Unmatched “Number of tolerance steps”	Check the “Number of tolerance steps”	Resume communication after re-setting the “Number of tolerance steps” of SENSORPAK and PC.

6.2 Troubleshooting

- Communication does not take place with the counter:
  - Are communication conditions matched?
  - Is the “COM port number” correct?
  - Is the counter in the “preset value setting” or “tolerance limit setting” mode?
  - Is the I/O cable directed correctly?

  If the problem still persists, perform a communication check with the “Terminal software (Terminal emulator)”. After confirmation with “Terminal software”, restart the PC.

- The system will not start up after a software reinstallation or upgrade:
  - Install the software after deleting the current SENSORPAK with the Program Add/Delete function.
  - If SENSORPAK directories remain after the program is deleted, manually delete the directories.

- Data logging will not take place if the [Logging Start] button is clicked on:
  - Are the Option Panel settings correct?
  - Is the [Pause] button ON?

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