

# FGS-VC Series Motorized Stand

## Software Operation Manual



Read Manual thoroughly prior to operation.

Use instrument only after reading the complete manual.

Follow all safety precautions.

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## 1. Software Overview

Thank you for choosing the FGS-VC Series Motorized Stand; as an added feature the FGS-VC can be operated with the free software FGT-VC.

### What is FGT-VC?

FGT-VC is an Add-in tool for Microsoft Excel, allowing easy download and analysis of the data gathered during testing.

**Read this operation manual carefully prior to use. It holds important information on how to properly install and use the Shimpo FGT-VC Software.**

For additional updates and support, visit our website at: [www.shimpoinst.com](http://www.shimpoinst.com).  
or call local Shimpo office.

## 2. Software Requirements and Initial Information

The FGT-VC is an Add-in tool for Microsoft Excel 2003, 2007, or 2010.

This tool allows data to be collected and downloaded via USB cable, which in turn tabulates the data to useful information.

### Software requirements:

- Windows XP, Windows 7
- Microsoft Excel 2003, 2007, 2010

### Software features:

- Download data during testing(MANU/SING/CONT/PROG mode)
- Set repeat count and sampling rate
- Graph function
- Judgment of upper and lower limit
- Statistic calculation
- Set trigger function

Microsoft Excel is registered trademark of Microsoft Corp.

## 3. Reminders



Caution :Warns of important safety information



Reminder: Notes important information on the product.



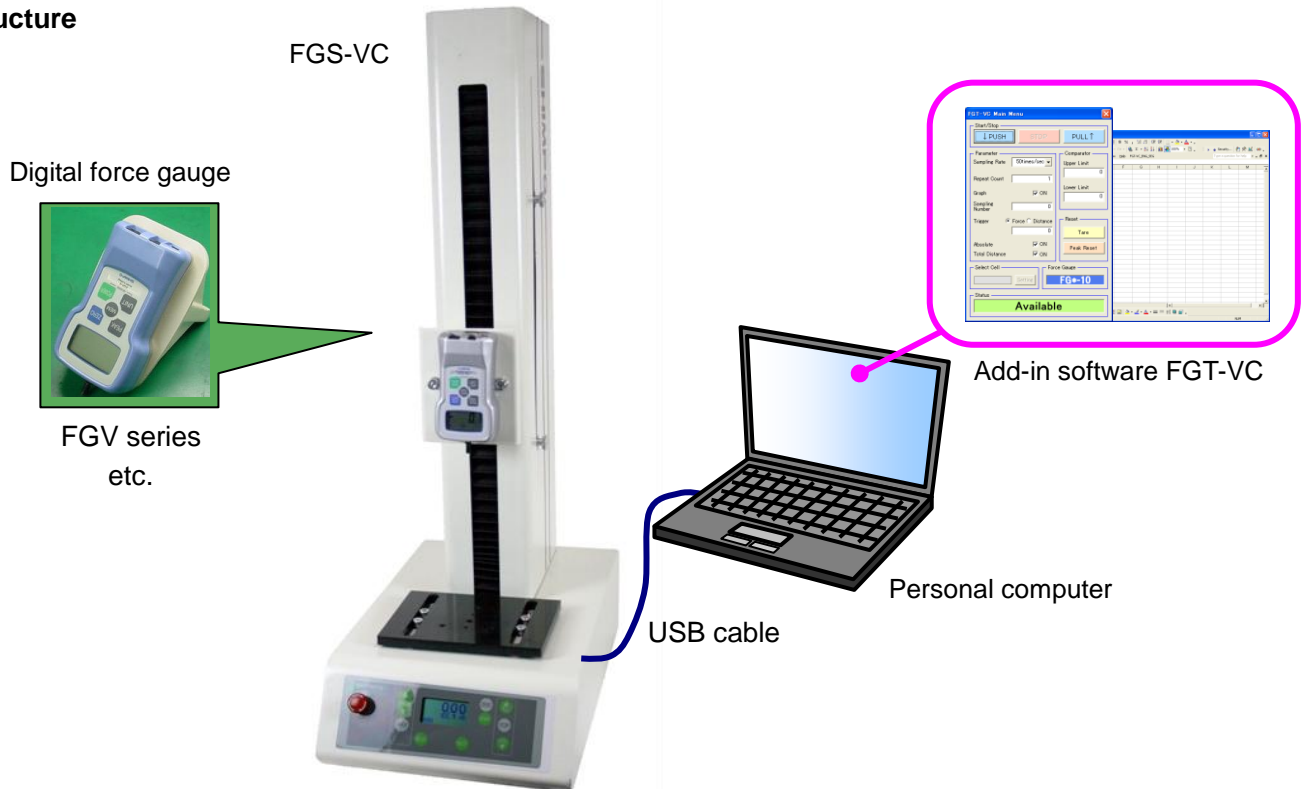
The copyright of the software and its documents belongs to Nidec-Shimpo America Corp.  
The foregoing warranties are exclusive and in lieu of all other express and implied warranties (except of title including but not limited to implied warranties of merchantability, fitness for a particular purpose, performance, or otherwise), and in no event shall the Company be liable for claims (based upon breach of express or implied warranty, negligence, or otherwise) for any other damages, whether direct, immediate, incidental, foreseeable, consequential, or special.

## 4. Set Up Procedure

### What will you need to get started?

- A copy of the FGT-VC software, this software can be downloaded from [www.shimpoinst.com](http://www.shimpoinst.com)
- Visit this website for future and additional updates.
- USB cable plugged in to an open port from the Host PC.
- USB port 1.1 or higher
- Microsoft Excel 2003, 2007, 2010 (these versions includes the necessary libraries needed to make the software operates).

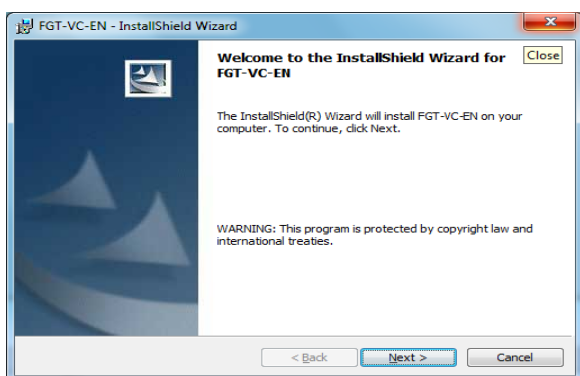
### Structure



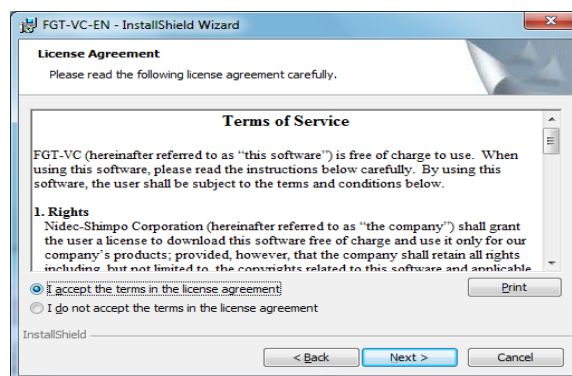
## 4.1. Install Procedure of FGT-VC Application Software

Double click the FGT-VC-EN\_v\*\*\*.msi, the Windows installer is started.

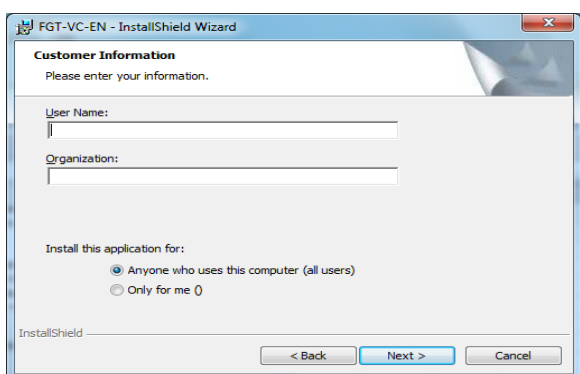
\*The software name is different depending on the version.



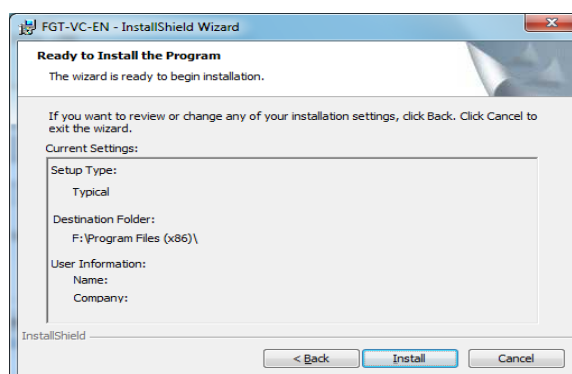
Click "Next >".



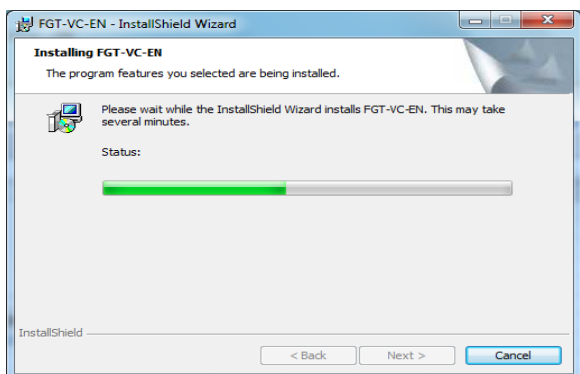
Read the Terms of Service.  
If you agree, click the button of  
"I acept.....", next click "Next >".



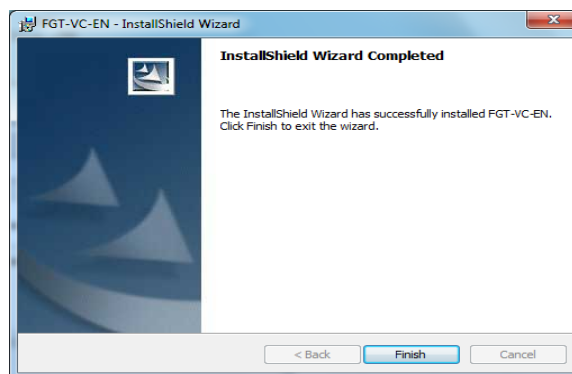
Fill in User Name and Organization.  
Click "Next >".



Confirm indicated items.  
Click "Install".

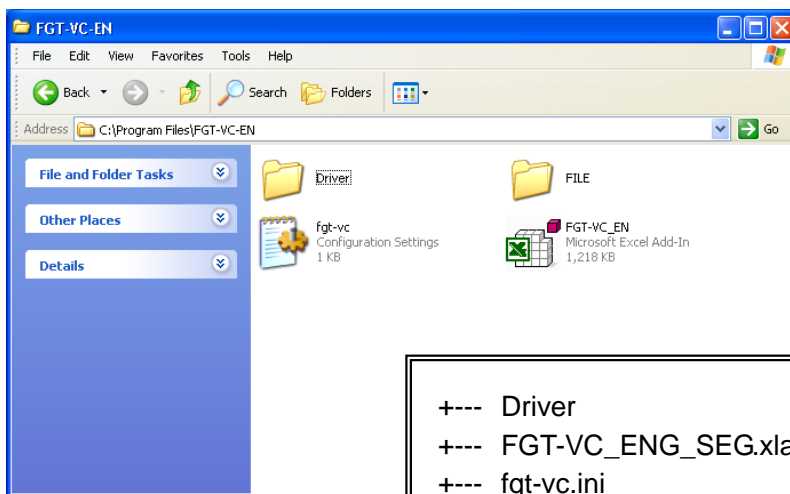


Start to install.



When complete to install,  
click "Finish".

After completing the install, the folder of “c:\Program Files\FGT-VC\_EN” is made, and the files and folder are stored as shown in below diagram.



- |      |                    |  |
|------|--------------------|--|
| +--- | Driver             | : USB driver folder                      |
| +--- | FGT-VC_ENG_SEG.xla | : Excel Add-in software (FGT-VC)         |
| +--- | fgt-vc.ini         | : FGT-VC ini file                        |
| +--- | FILE               | : Saving folder of measurement data file |

※ In case of 64bit OS, FGT-VC-EN folder is created in c:\Program Files(x86)



Do not change the content or move the Driver folder and fgt-vc.ini.  
The software might not operate properly.

## 4.2. Installation Procedure of USB Driver for FGT-VC

Turn on FGS-VC, and connect the USB cable between FGS-VC and your PC.

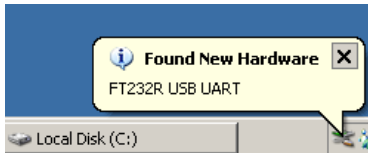
The message balloon of detecting new hardware is displayed in lower right of screen.

After that, the USB driver starts to install.



The USB driver should be installed after 4.2. Install Procedure of FGT-VC Application Software.  
If the software of other Shimpo products has been installed, the message balloon of new hardware might not be displayed. In this case, the setup of this chapter is unnecessary.

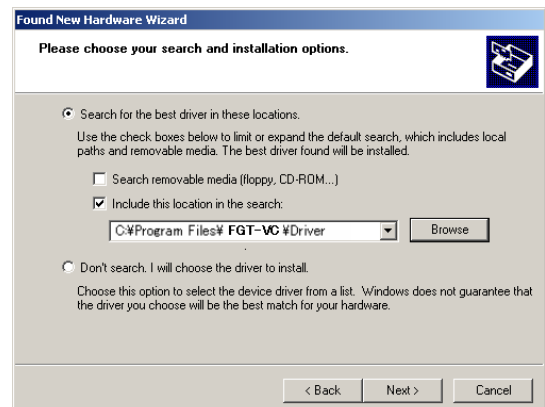
### \*This is the direction for Windows XP



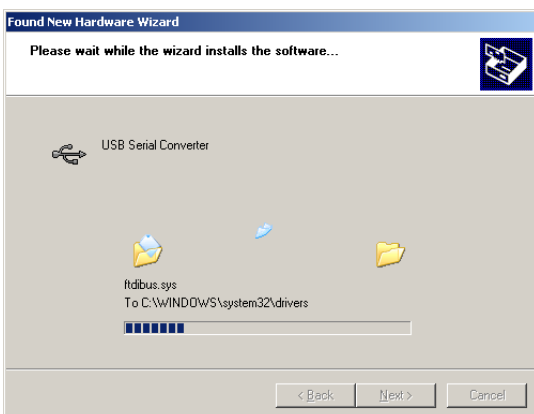
If confirmation window of “Windows Update Communication” is appeared, please select “No, do not connect this time (T)”.



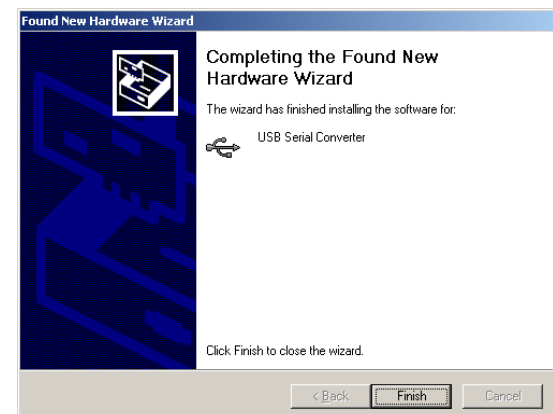
Set the check button of “Install from a list or specific location (Advanced)”.  
Click “Next >”



Set the check button of “Search for ...”,  
and set the check box of “Include ...”.  
Input “C:\Program Files\FGT-VC\Driver”  
using “Browse” button.  
Click “Next >”.



Installing USB driver

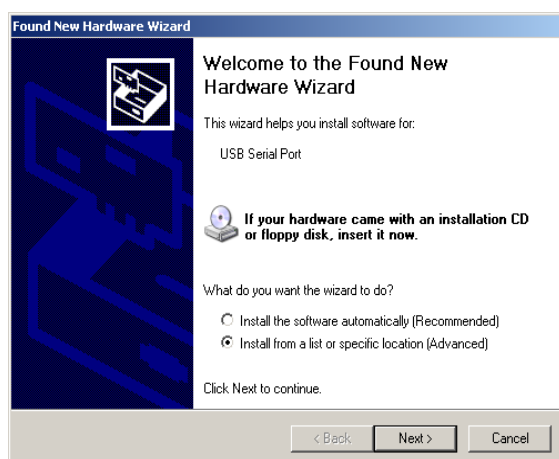


Completing to install USB driver.  
Click “Finish”.

Next process is the installation of USB serial port.



If confirmation window of “Windows Update Communication”, please select “No, do not connect this time (T)”.



Install the USB serial Port same as the previous procedure of the FT232R USB UART.

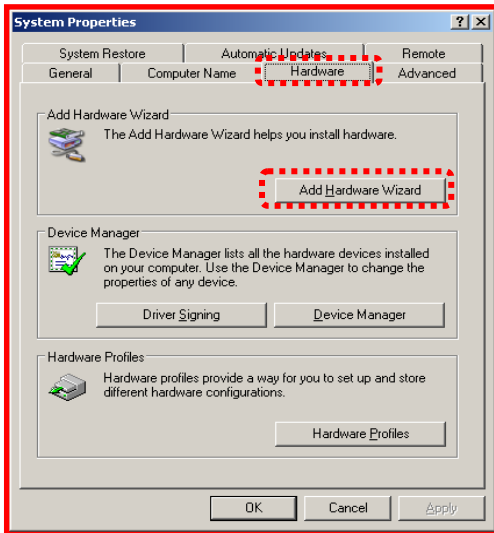
Completing to install USB serial port. Click “Finish”.

Windows will confirm the presence of a new hardware (dialog box will appear on the lower part of the screen). All installation is finished.

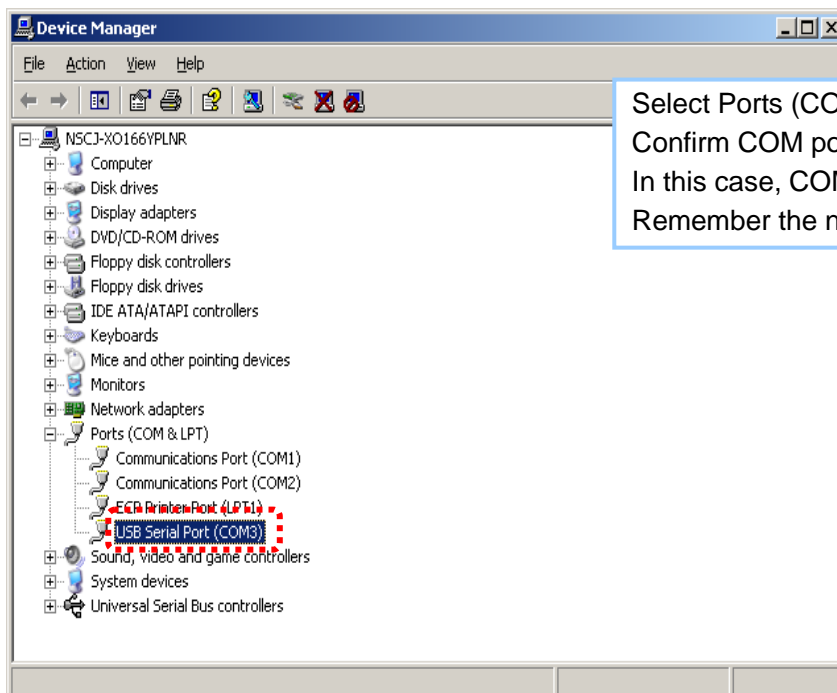
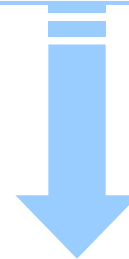


## ● Confirmation of COM Port

After the installation (4.1, 4.2, 4.3), select the COM port or set COM port.  
Open the Control Panel, then double click the System.



Select Hardware tab.  
Click Device Manager.

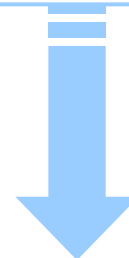


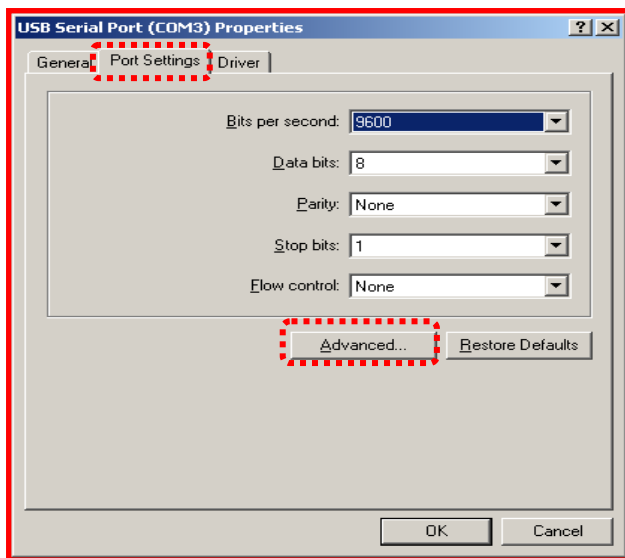
Select Ports (COM & LPT).  
Confirm COM port No.  
In this case, COM port No. is 3.  
Remember the number.

Proceed to step. 5

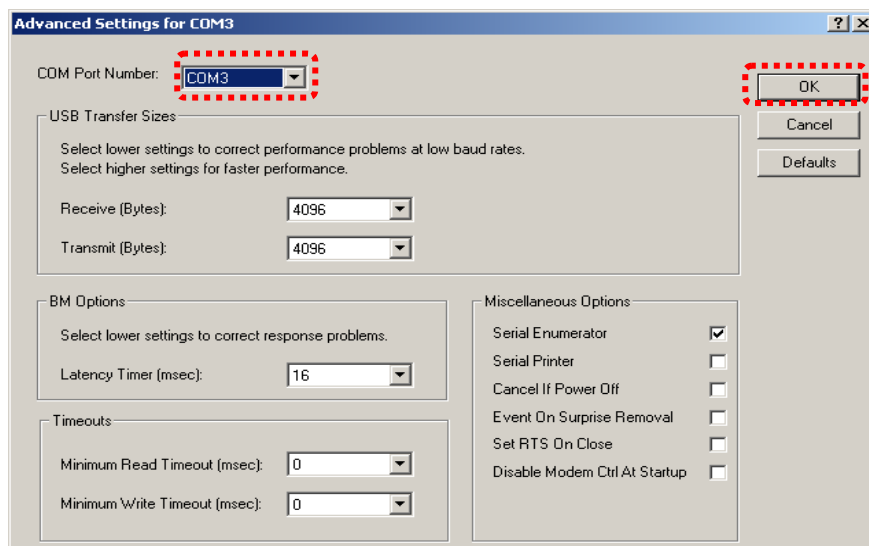
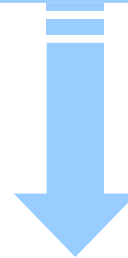
Follow the following procedure only If COM port No. is not from 1 to 15, it is necessary to search the empty port of 1 to 15 and change the COM port.

Go to “**USB Serial Port (COM)**” by left mouse button.  
Right click and click “Properties”.





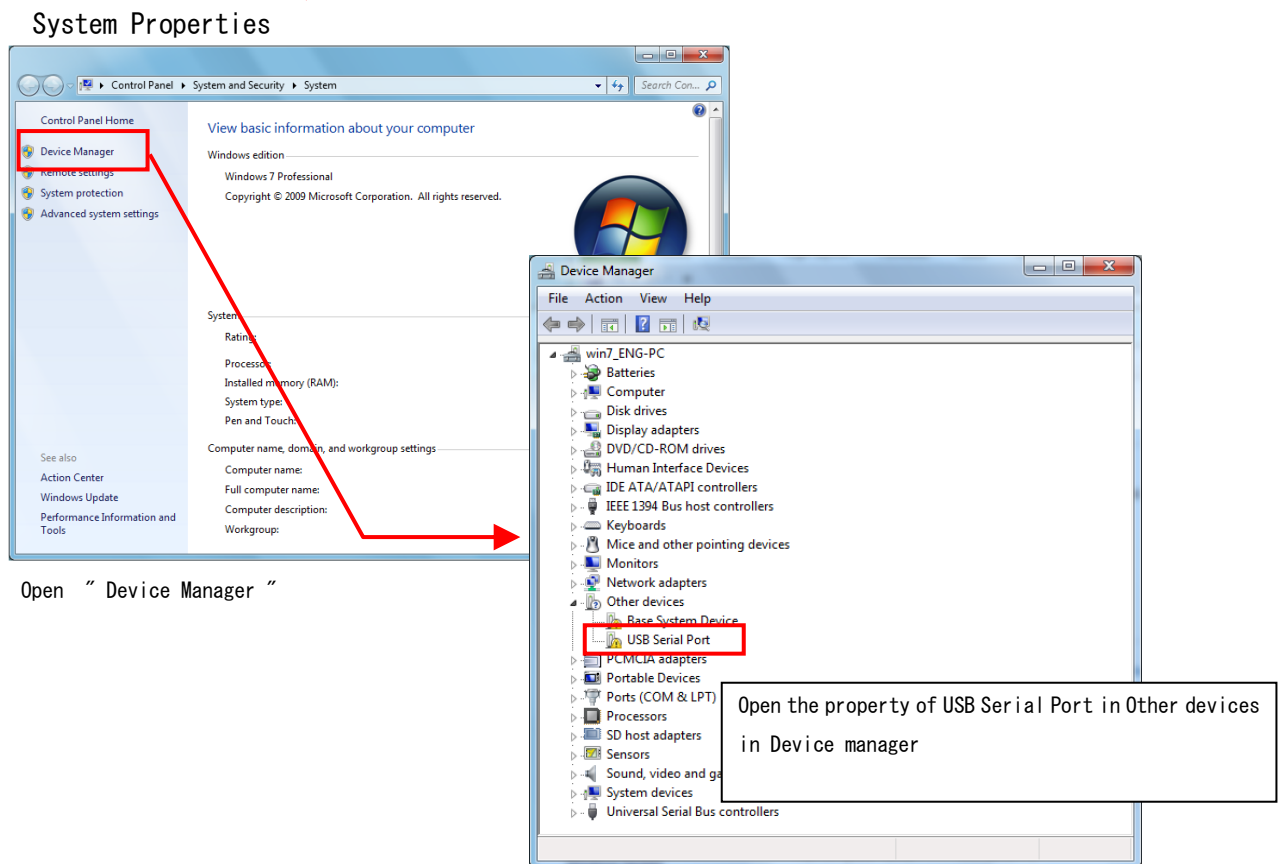
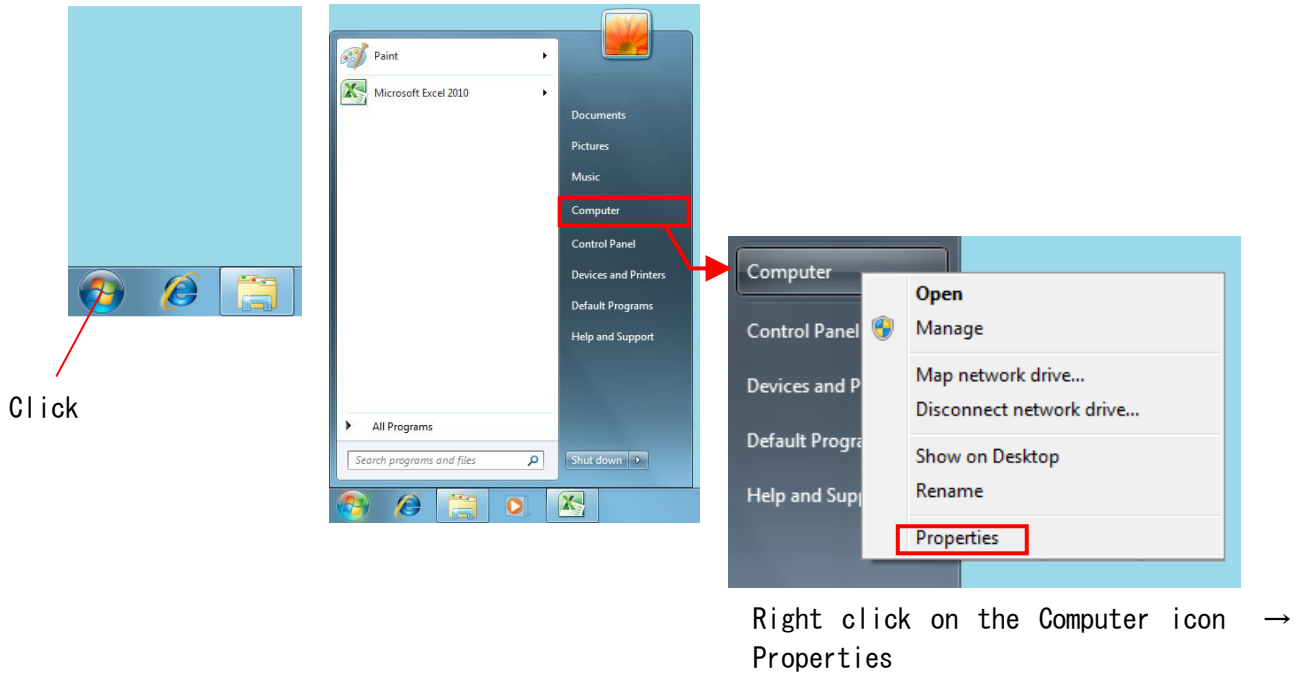
Select "Port Settings" tab.  
Click "Advanced..."

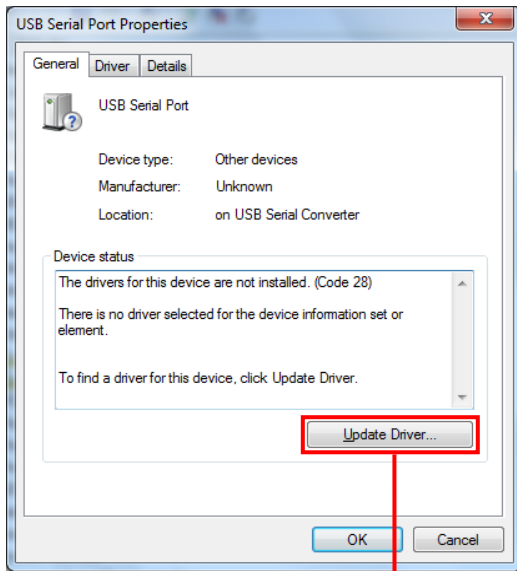


In the list box of "COM Port Number", select a COM port without "[in use]" from COM1 to COM15.  
Click "OK".  
Remember the number.

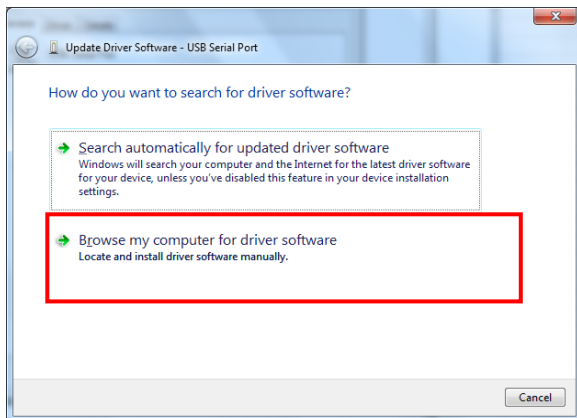
## \*This is the direction for Windows 7

After turning on FGS-VC, connect the USB cable between the stand and the PC. After that, go to Device manager.

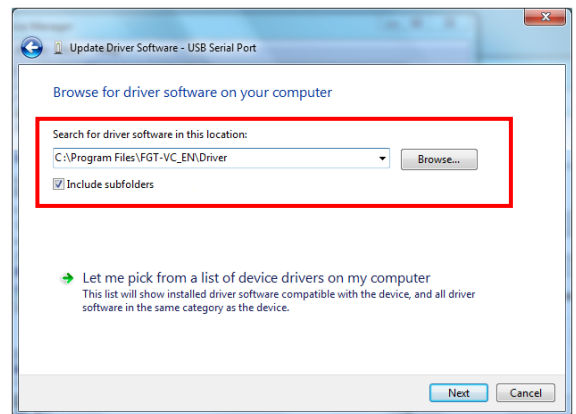




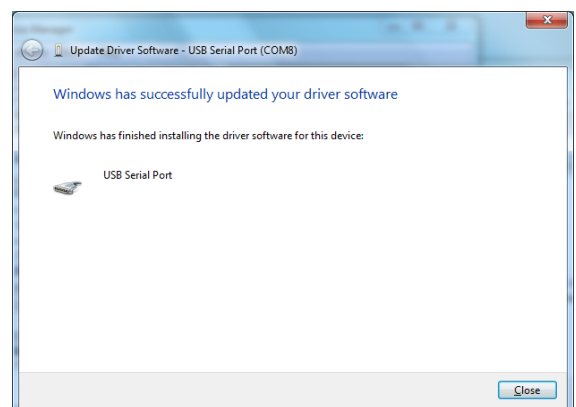
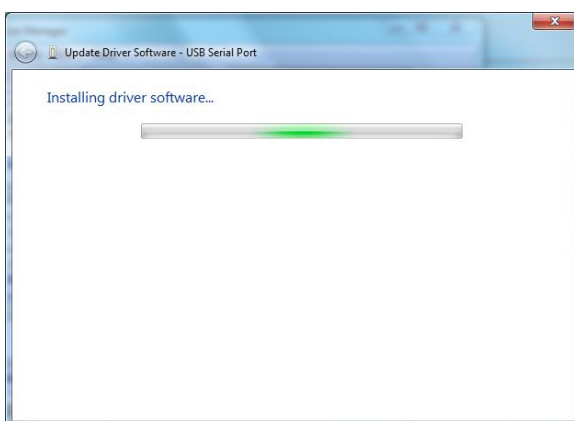
Select Update Driver icon



Choose Browse my computer for driver software



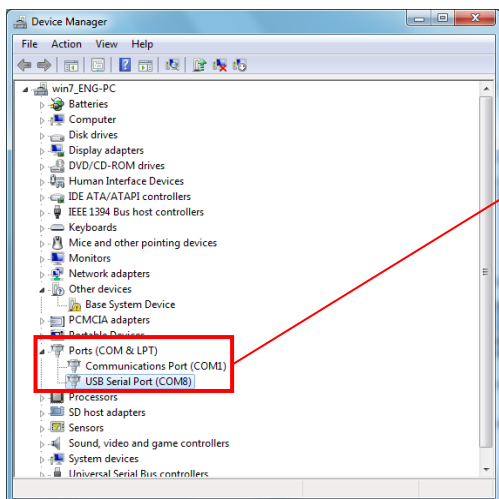
Choose 「Browse」 and choose 「C:\Program Files\FGT-VC\Driver」 (※) in case of 64bit OS, browse to C:\Program Files(x86)\FGT-VC\Driver



Installation finished

## ●Confirming COM port number

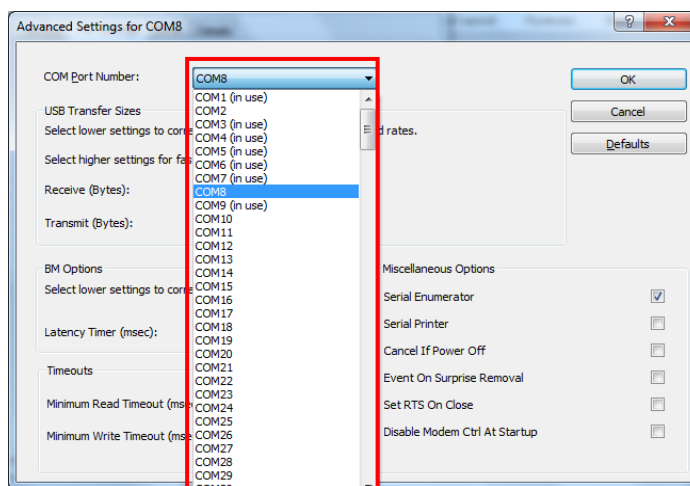
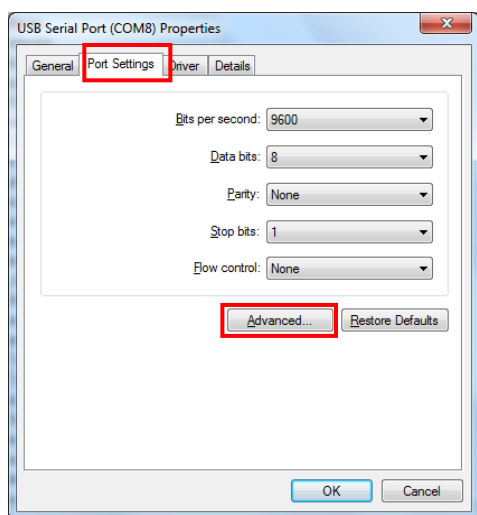
Check the assigned COM port on the device manager



USB Serial Port (COM□)

## ●Changing the COM port number

If you desire to change the COM port number, please refer to the screen shot below

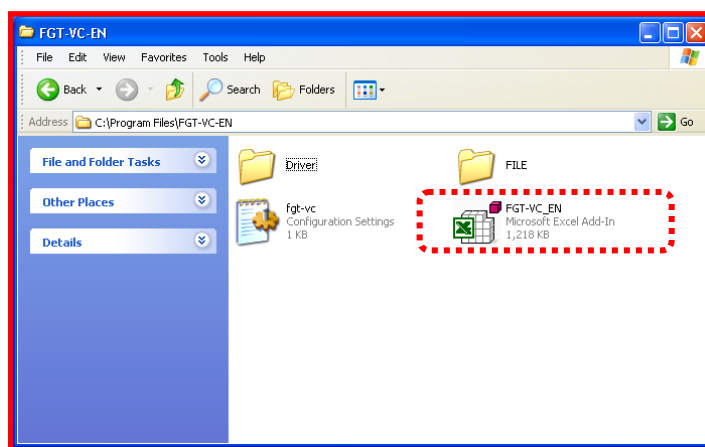
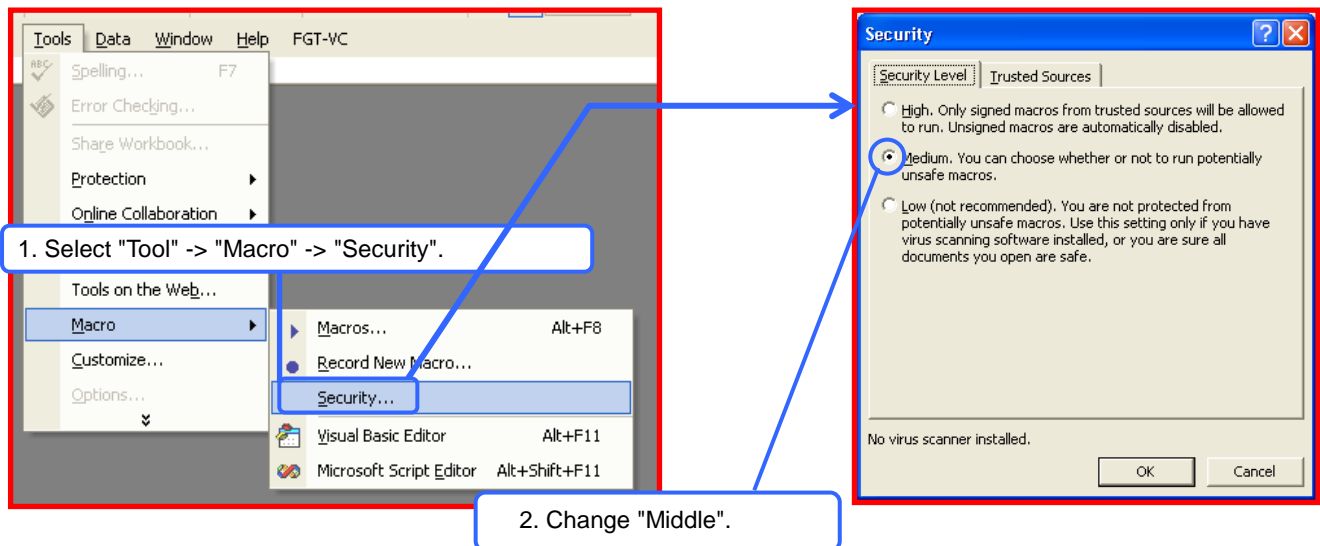


## 5. Adding the FGT-VC Software

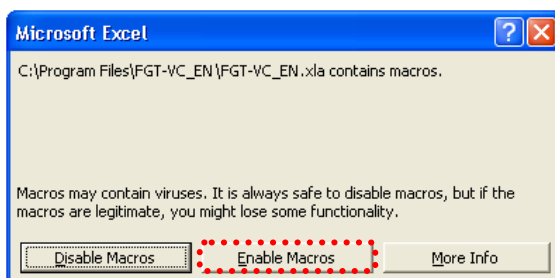
### 5.1. Startup

Open Excel. The security level of Excel should be changed to “Middle” before beginning the application

**\*This is the direction for Excel2003**



Double click “FGT-VC\_EN.xla” in the folder of “c:\Program Files\FGT-VC\_EN”.



After starting the “FGT-VC”, the below screen is displayed. Click “Enable Macros”, “FGT-VC” will be added at menu bar of Excel.



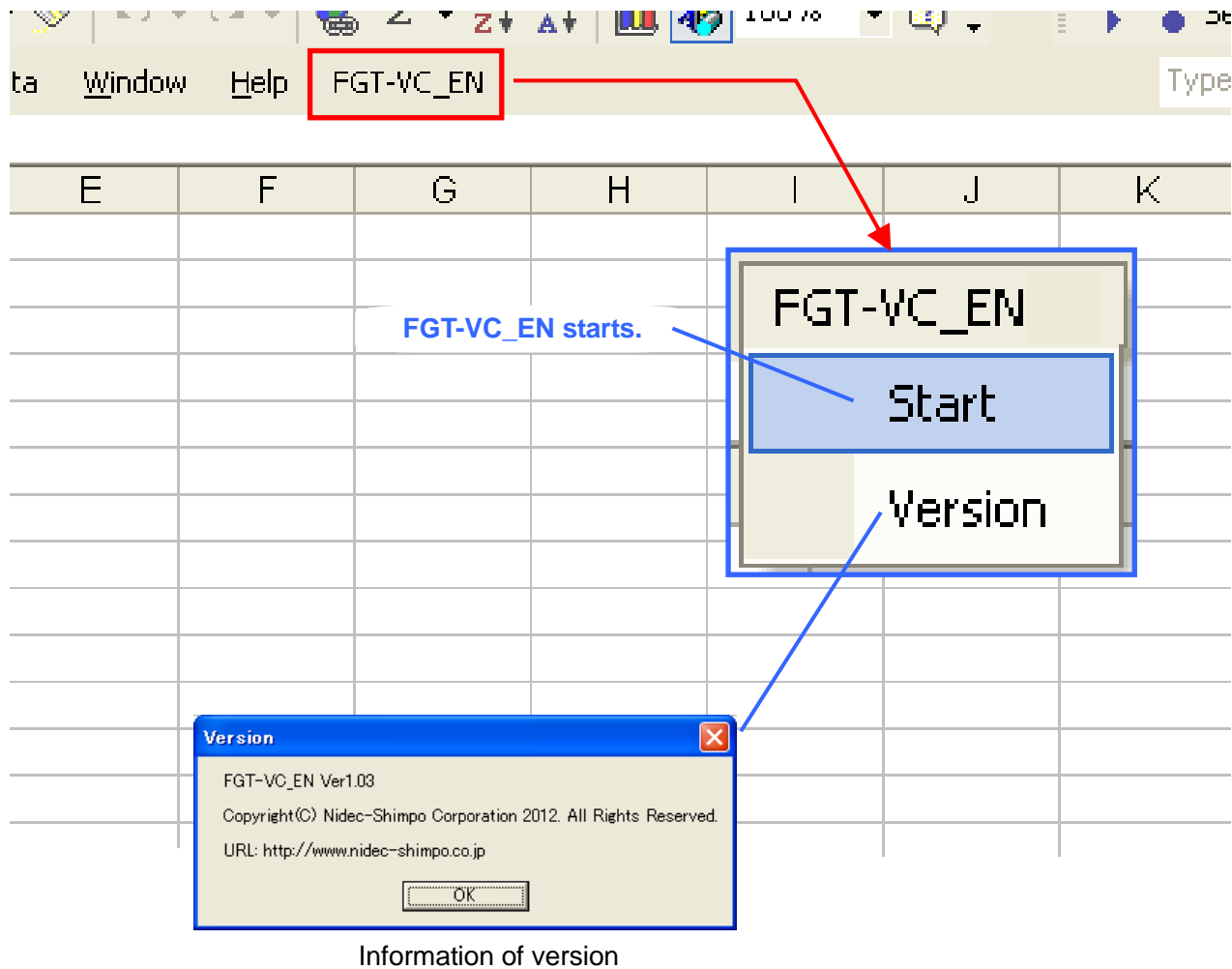
The software might not operate normally when the Add-in software for our measurement equipment Other than this software or the macros of other Excel programs are enabled. Disenable other software or macros when this software is in use.

Turn the power of the FGS-VC.

The FGT-VC starts when the Start in the menu is clicked.

Click the Version in the menu to see the version information of the software.

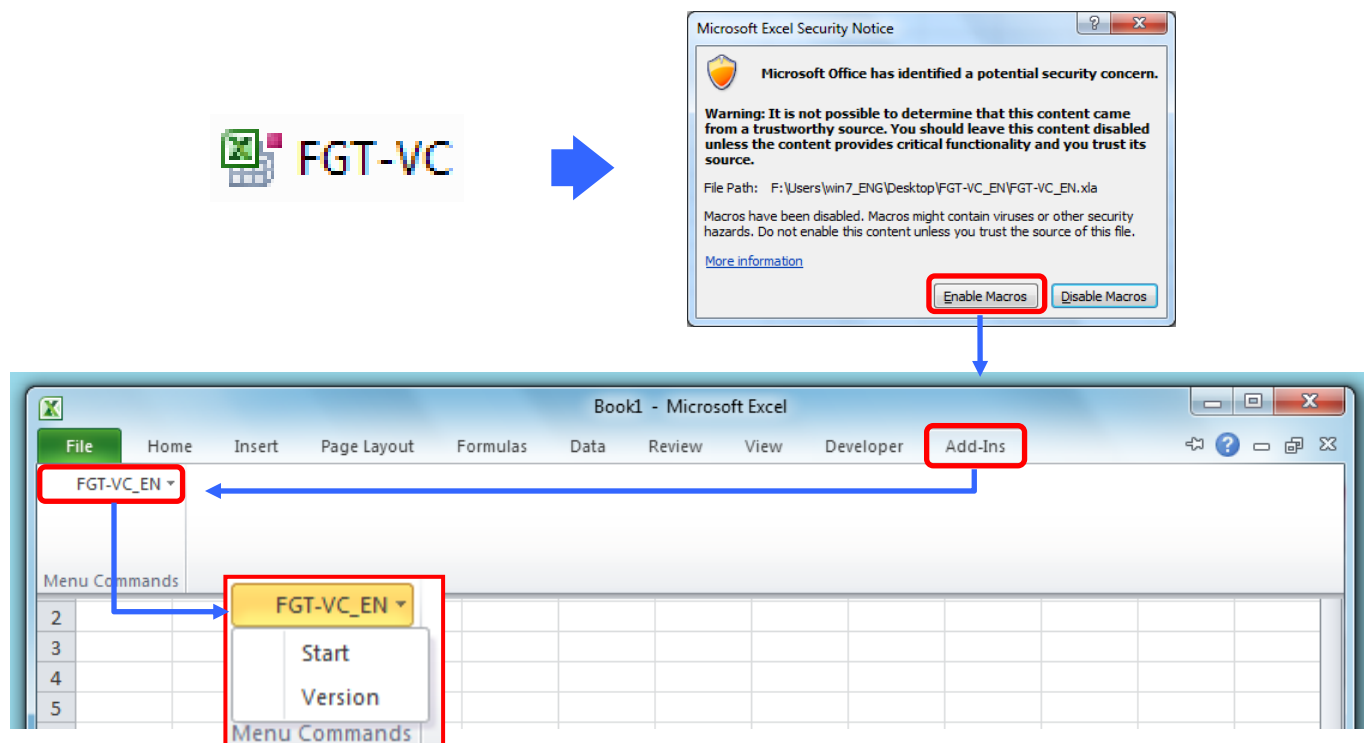
The name of the software may be different depending on the version





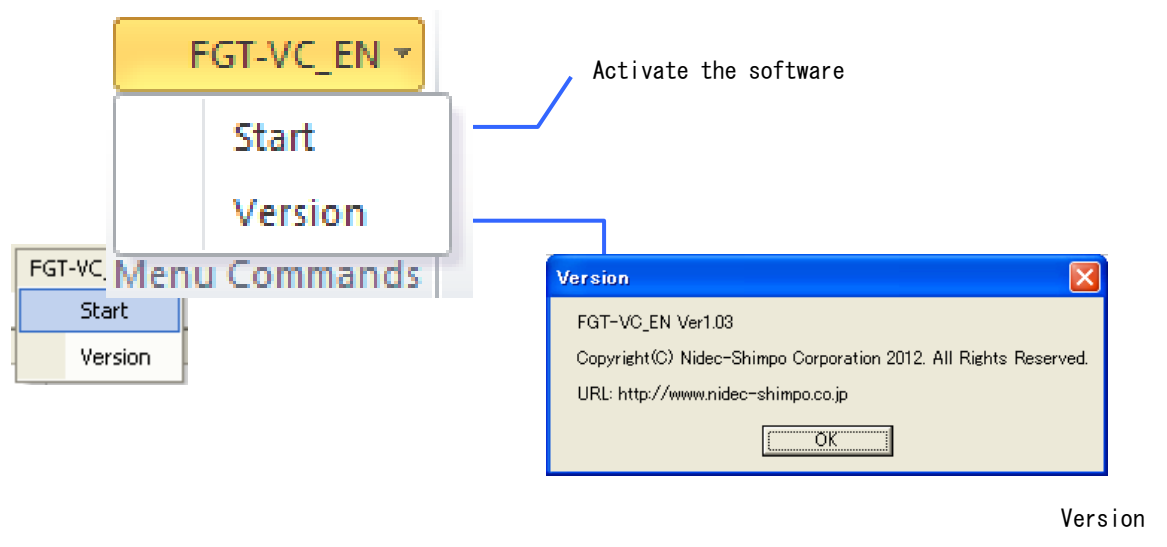
## \*This is the direction for Excel2007,2010

- After starting this FGT-VC software, make sure that macro settings shows Enable Macros  
Then, FGT-VC menu appears in Add-Ins



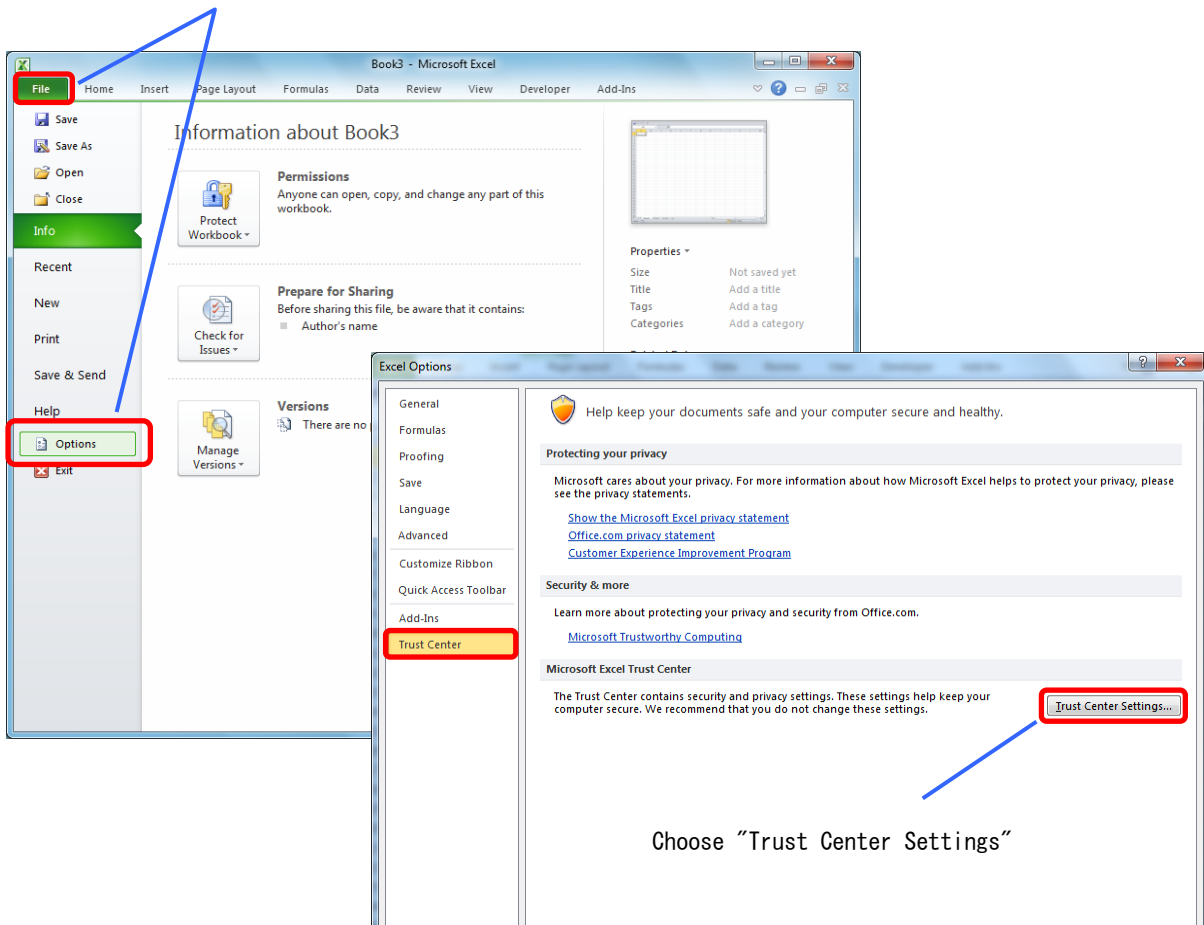
- After connecting FGS-VC and PC, open the new sheet, and activate the software by clicking START on FGT-VC\_EN addin software

- Version information can be checked as shown below

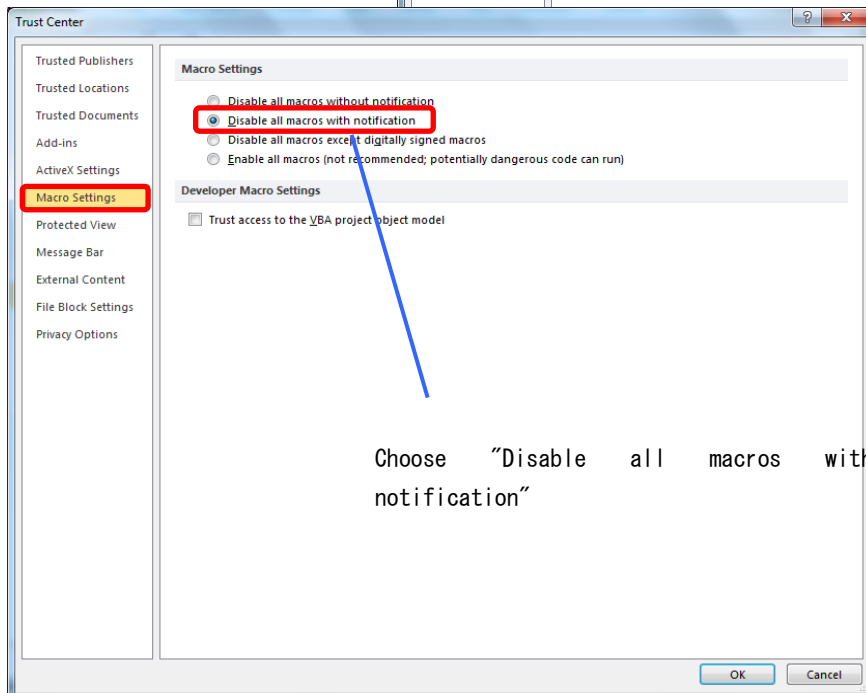


- If macro setting does not appear, change the settings manually by following the procedure below

Click File on the Excel tool bar and open Options.



Choose "Trust Center Settings"

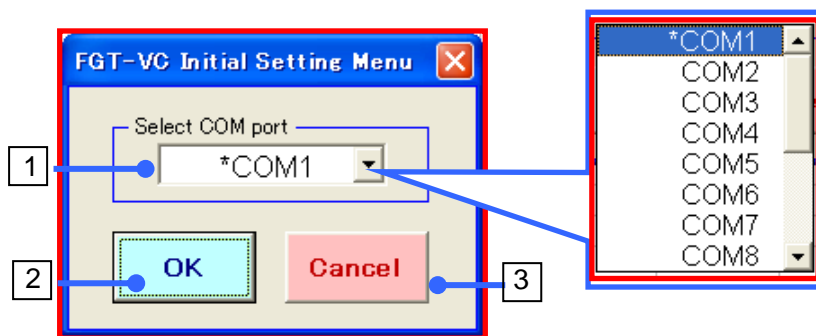


Choose "Disable all macros with notification"

## 5.2. Initial Dialog

When the software starts normally, the initial screen will appear at first.

Note: Gauge must be connected and powered on, otherwise an error message will appear.



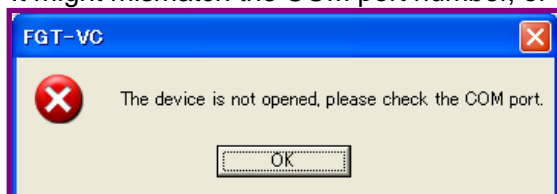
1	Selection COM port	Select the COM port number in the list box. It should select the number which is confirmed or set at Section 4.4 Confirmation of COM port. The available COM port is marked.
2	OK button	Go to main menu.
3	Cancel button	Exit the software.



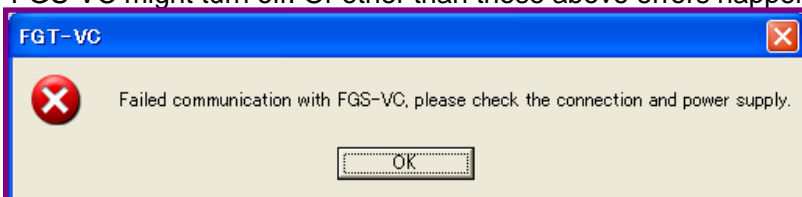
After clicking the OK button, if the PC can not communicate with the FGS-VC, the main menu does not appear.

Possible issues

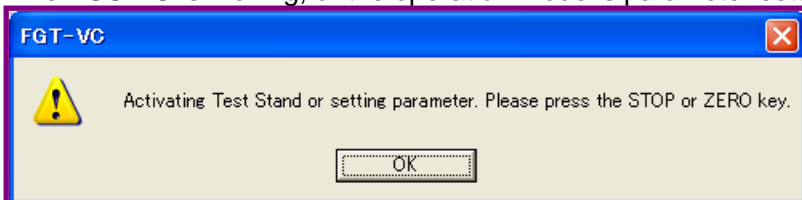
1. It might mismatch the COM port number, or PC is not connected with FGS-VC.



2. FGS-VC might turn off. Or other than those above errors happen.



3. The FGS-VC is moving, or the operation mode is parameter setting.



## 5.3. Measurement Data File

In the FGT-VC, the measurement data file is named automatically and is temporarily stored in the c:\Program Files\FGT-VC\FILE.

You must save the data file manually, otherwise the data will not be stored in the file for future retrieval.

**File Name**

"VC" + Year/Month/Day(8 digits) + "-" + Sequential number + ".xls"

Example: **VC20090401-2.xls**

The file made at the 2<sup>nd</sup> time in 2009 April the 1<sup>st</sup>.

**Sheet Name**

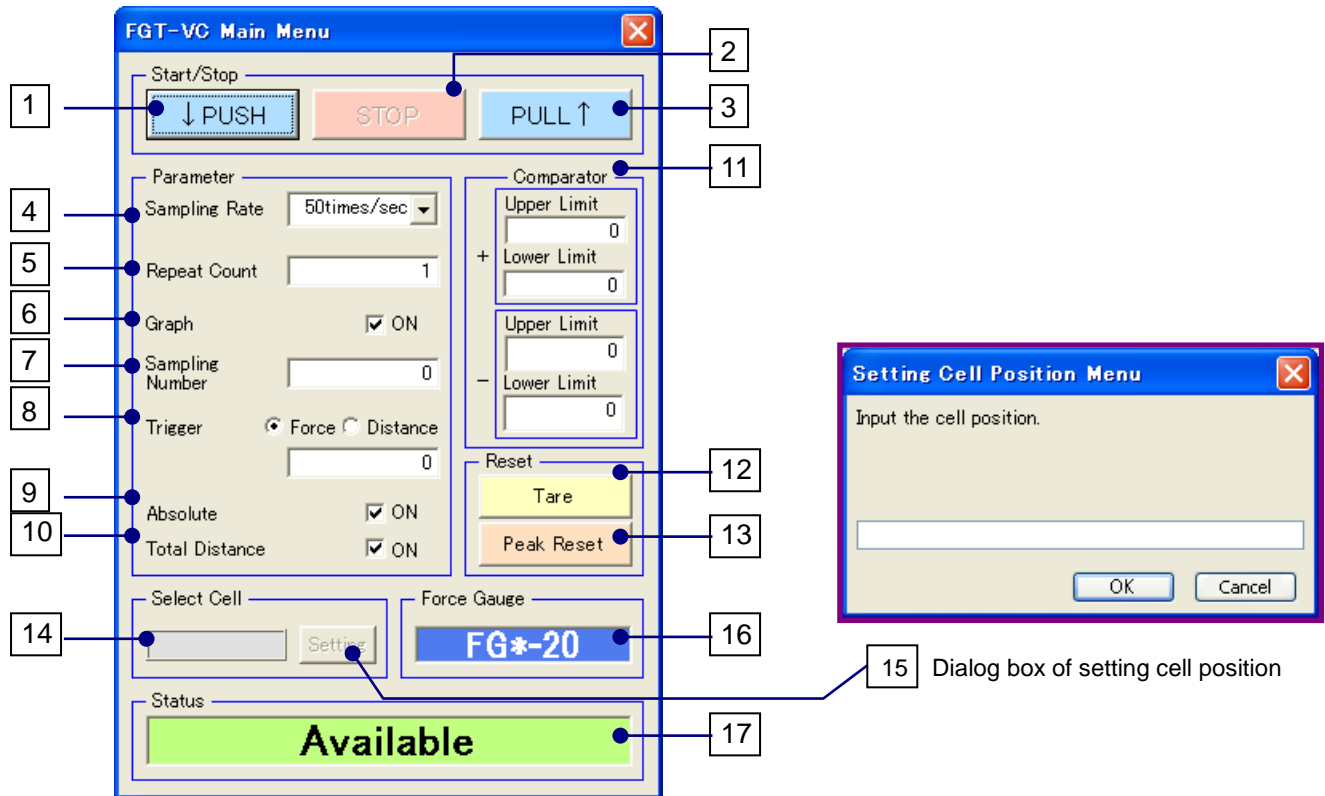
The name of the sheet of Excel is "VC-" + Sequential number.

Example: **VC-17**

It is the 17<sup>th</sup> measurement data.

## 5.4. Main Menu

The buttons and boxes are described following table.



No.	Items	Description	Input range	
1	PUSH button	PUSH direction movement begins and measurements are taken. Operation depends on the mode of the FGS-VC		
2	STOP button	Stop measurement and stand movement.		
3	PULL button	PULL direction movement begins and measurements are taken. Operation depends on mode of FGS-VC		
4	Sampling Rate	List box consists of 10, 20 and 50 times/sec.		
5	Repeat Count	Set the repeat count at CONT and PROG mode.	1 – 9999	
6	Graph check button	The graph of force vs. distance is generated if checked.		
7	Sampling Number	Set the available measurement times in CONT or PROG mode. Because the measurement time of these modes is maximum 9999, all measurement data can not be obtained by the limitation of sheets. Thus, it may be necessary to thin out the recorded data. This number is the value of the sampled data.	Graph on Graph off	0-250 0-9999
8	Trigger	Force	If $ Force  \geq Trigger$ , start to measure.	
			0.00 – 15.75"	

		Distance	If $ Distance  \geq Trigger$ , start to measure.	Depend on the mounted force gauge.
9	Absolute check button	If checked, the force data indicates absolute value.		
10	Total Distance check button	If checked, the distance indicates total travel distance. If unchecked, the distance indicated is of the absolute movement or round trip of the test.		
11	Comparator Upper limit Lower limit	The maximum value is compared with upper and lower limit. Can not input the following equation. $(Upper\_Limit) < (Lower\_Limit)$ If Upper and Lower limit both are zero, the comparator does not work.		
12	Tare button	Operates tare of the gauge.		
13	Peak Reset button	Reset the peak value of the connected force gauge.		
14	Select Cell	The start cell position is displayed. Only available when the Graph check box is off.		
15	Setting Cell Position Menu	Click the Setting button in Select Cell. A menu will pop up. Input the desired starting position on the sheet where data will be deposited.		
16	Force Gauge	The model name of the connected force gauge is displayed.		
17	Status	Indicates the status of FGS-VC.		

\*1.

In case of PROG mode, the operation moves to the direction of PROG parameter regardless of clicked button(PUSH/PULL).

In case of JOG mode, the buttons do not work and testing cannot be performed with the software.

## 5.5. Measuring

Clicking **PUSH** or **PULL** button in the main menu, FGS-VC starts and measures.

### Measuring data

When FGS-VC starts, the Excel sheet records the measurement data of distance and force.

The number of measurement data points depends on the Sampling Rate.

10 times/sec	Get 10 measurement data per second.
20 times/sec	Get 20 measurement data per second.
50 times/sec	Get 50 measurement data per second.



The Sampling Rate is a rough value.

The setting parameter data is not guarantee to be accurate.

### Maximum measurement data

The maximum measurement data of one operation (count) is 32,000 data with Graph on and 65,000 with Graph off. When the input cell in Excel exceeds the limitation, the error message occurs and can not measure.



When the user saves very large measurement data into a file, the operating speed might be very slow or the PC might freeze.

Save to new BOOK file or overwrite frequently to eliminate this potential issue.

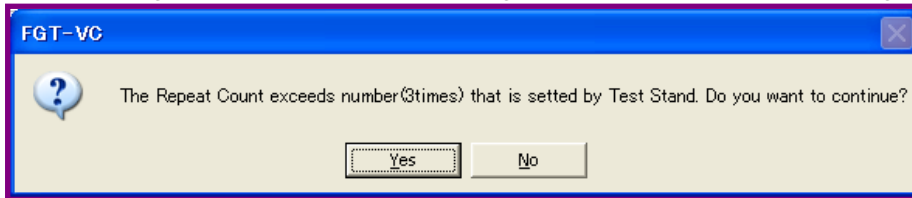
### Repeat Count

When the operation is continuously done in CONT or PROG mode, the Repeat Count is available. The parameter is able to set to a maximum of 9,999 counts with Graph off, 250 counts in Graph on.



The repeat count can be set by the FGS-VC stand or FGT-VC software.

When the setting value of the software is larger than the stand, the following message appears.



In this case FGS-VC starts to measure, however please note that the repeat count can be executed only up the setting repeat count on the FGS-VC stand.

### Sampling Number

Set the available measurement times in CONT or PROG mode. Because the measurement time of these modes are a maximum of 9,999, all measurement data can not obtained due to the limitation of sheet. It is necessary to thin out the recorded data. The sampling number is the value of the data that will be sampled. The setting data is number of thinning out.

When the Sampling Number is set apart from 0, the pick-upped measurement data is as follows.

Example: Repeat Count = 20 (Start VC-1)

Sampling No.=1 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

  
VC-1 Record the head to sheet

Sampling No.= 5 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

  
VC-1                      VC-2 Record 1st, 5th, 10th, 15th and 20th measurement to sheets

Sampling No.=10 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

  
VC-1      VC-2              VC-3 Record 1st, 3rd, 5th, 7th, 9th, 11th, 13th, 15th, 17th and 20th measurement to sheets

Sampling No.=20 

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

  
VC-1 Record all measurements to sheets

: Recorded measurements

### How to select from all measurement

- When the Sampling Number is 1, record the 1st measurement data.
- When the Sampling Number is more than 2, the record method is as follows.

$$A = \frac{y-1}{x-1} \quad (1)$$

Define

- A: Interval of recording
- x: Sampling Number
- y: Repeat Count

According to equation (1), let the recorded measurement be  $B(1), B(2), \dots, B(x)$ ,  $B(c)$ th measurement data is:

$$B(c) = A \times c + 1 \quad (2)$$

c: 1 to x

A first and last measurement is always recorded.

If the Sampling Number is 0, all measurement is recorded.



The Sampling Number can not have a value larger than the Repeat Count.

If the wrong value is set, the following message box will appear.



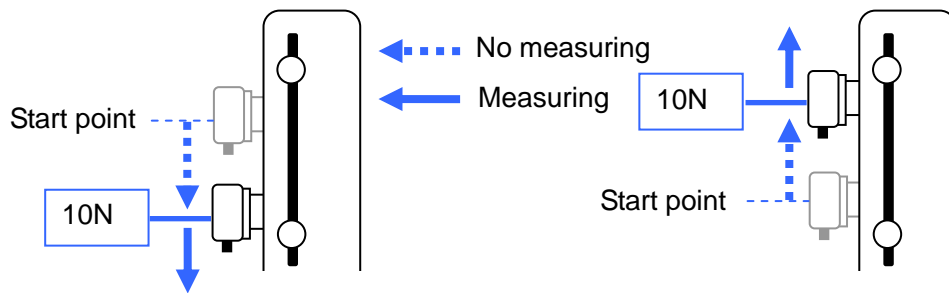
### Trigger

The timing to the acquisition starting the measurement data can be decided by the Trigger.

The Trigger is initiated by the absolute force of distance data

If the Total Distance button is checked, the trigger detects by total distance.

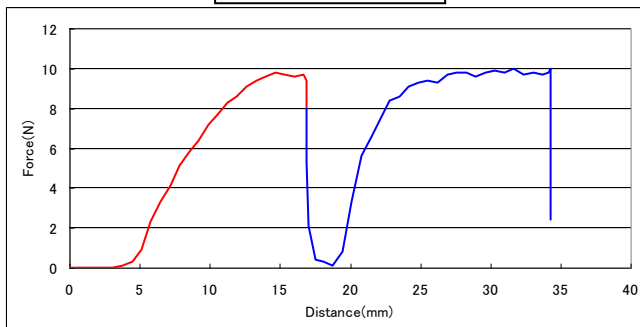
Example: Trigger is set 10N.



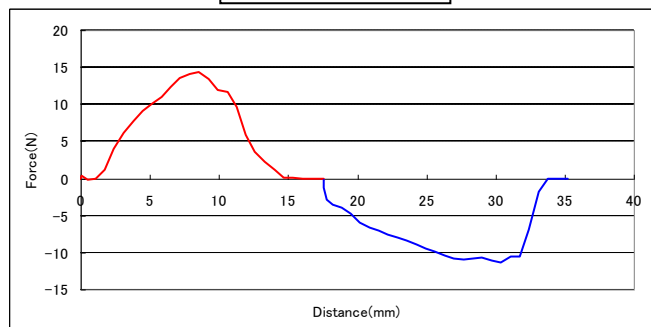
### Absolute

If the Absolute check button is ON, the force data indicates absolute value.

Absolute ON



Absolute OFF

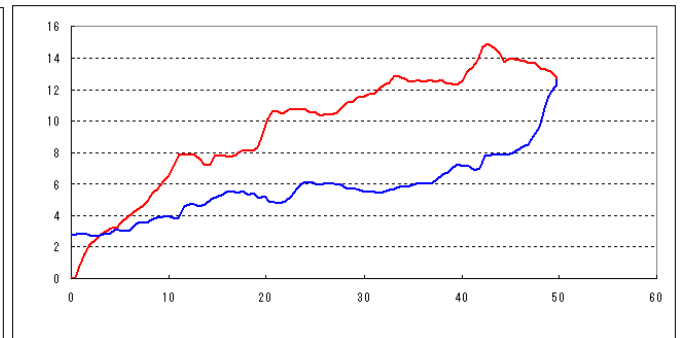
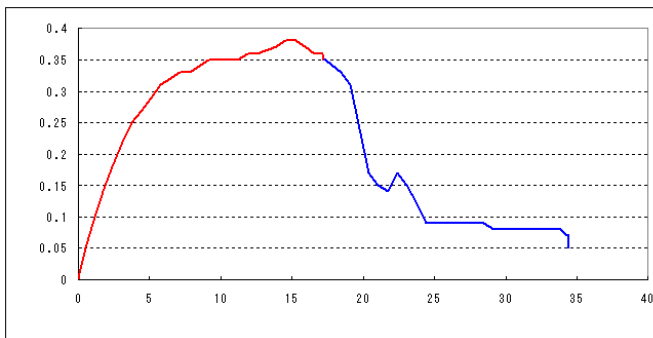
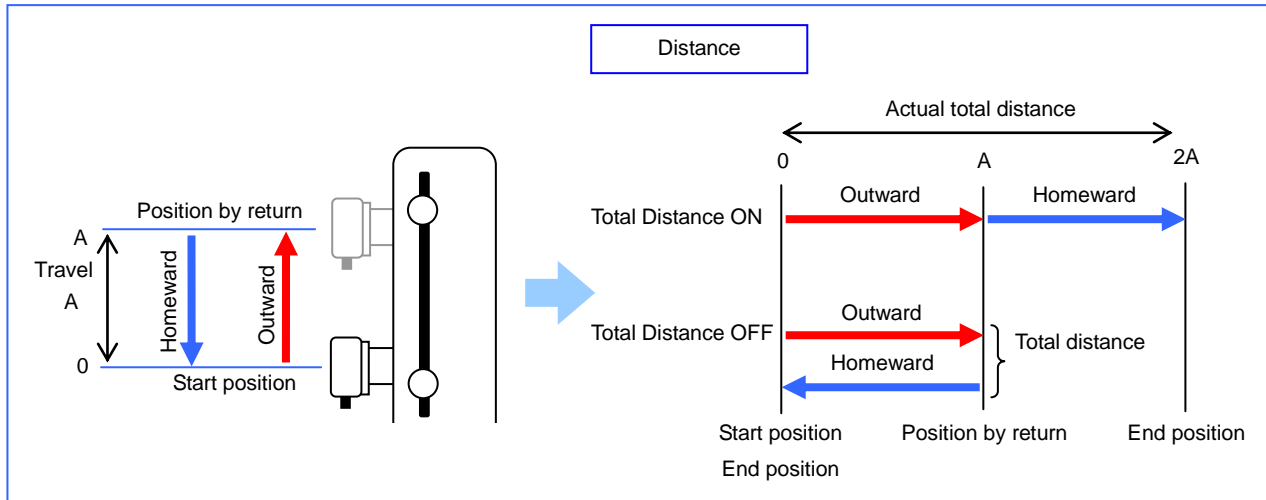


### Total Distance

If the Total Distance button is checked, the distance indicates total movement.

If OFF, the distance indicates absolute or round trip of the movement.

The check is available in SING, CONT and PROG mode.



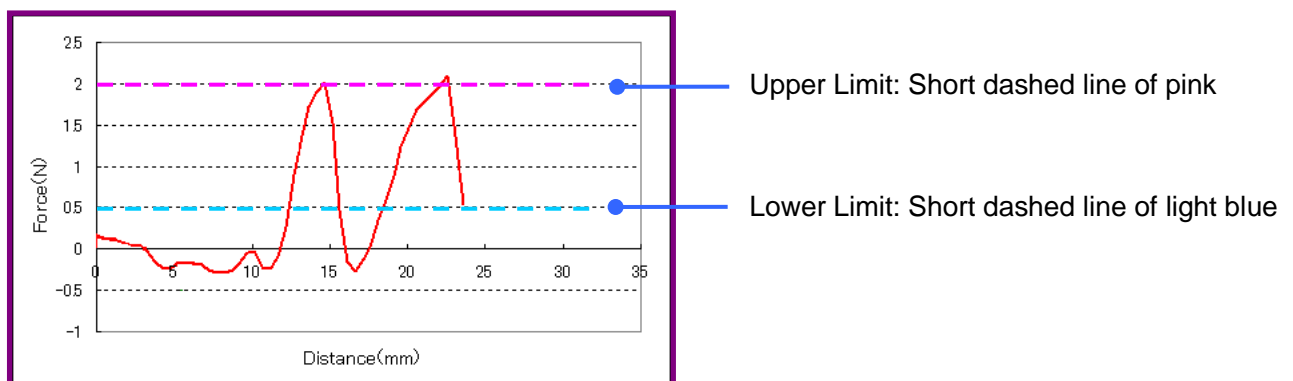
### Comparator

The maximum value is compared with upper and lower limit.

If Upper and Lower limit both are zero, the comparator does not work.

Condition	Result
$(Lower\_Limit) \leq (Maximum\_Value) \leq (Upper\_Limit)$	OK
$(Upper\_Limit) < (Maximum\_Value)$	HIGH
$(Lower\_Limit) > (Maximum\_Value)$	LOW

In case of graph, the Upper and Lower Limit are displayed as follows:

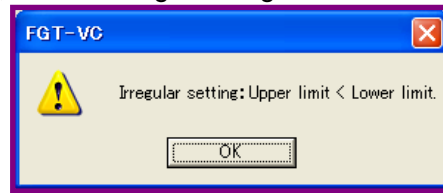






The Upper and Lower Limit can not be input  $(Upper\_Limit) < (Lower\_Limit)$ .

If the wrong value is set, the following message box will be indicated.

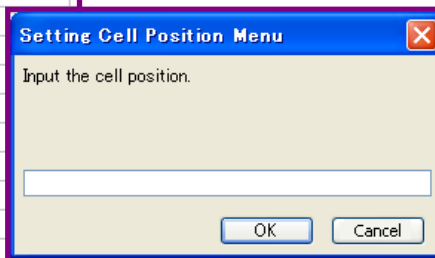
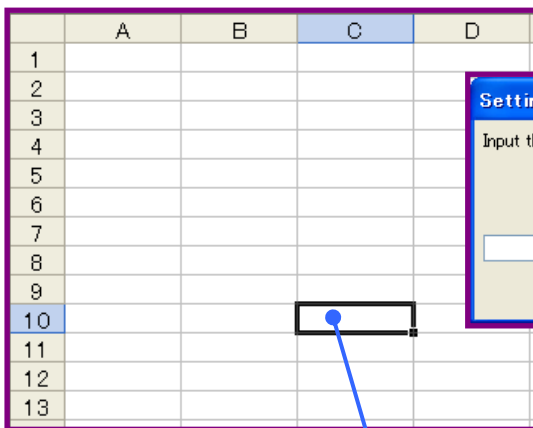


### Select Cell

The Select Cell is available when the Graph check box is OFF.

If the Graph is ON, the cell position fixes (\$A\$1).

When the Setting button has the Graph OFF, the following input dialog is displayed.



Setting Cell Position Menu

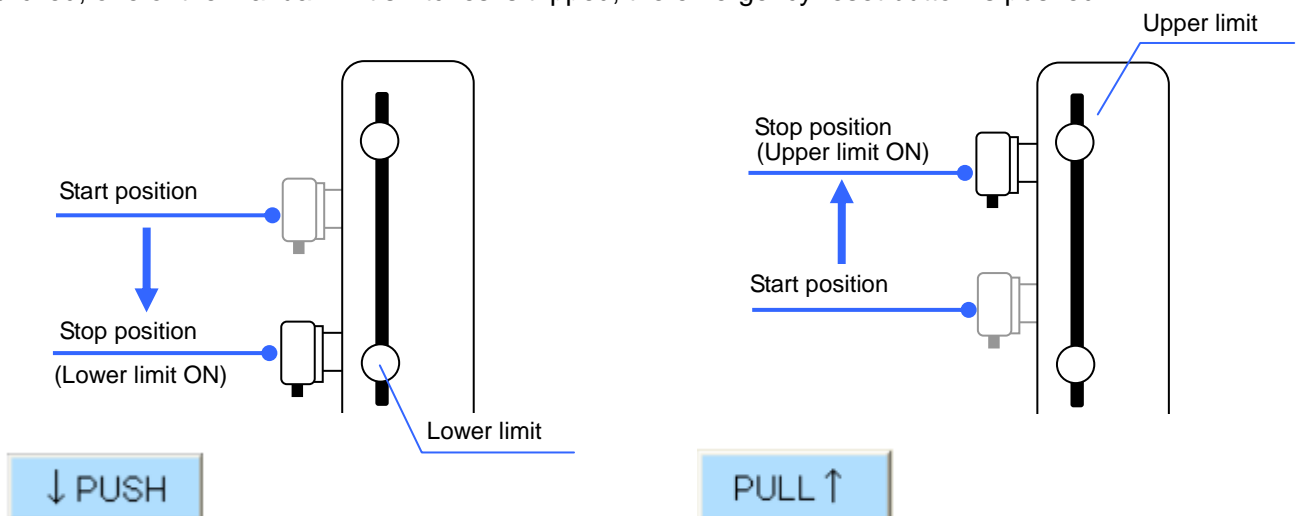
Measurement data is stored from the selected cell position.

Note :If the cell position is selected over an area, the start position is on the upper left cell. )

## 5.6. MANU mode

### 5.6.1. Operation

The test stand will move in the downward or upward direction when the respective **PUSH** or **PULL** button is clicked. The stand will continue to move in the selected direction until one of the following occurs: **STOP** button is clicked, one of the manual limit switches is tripped, the emergency reset button is pushed.



### 5.6.2. Record of Measurement Data

The record sheet is as follows:

Graph ON

	A	B
1	Date	2012/10/26 14:39:56
2		
3	Direction	PUSH
4	Test mode	MANU mode
5	Force Gauge	FG*-10
6	Force Unit	N
7	Sampling Rate	50times/sec
8	Trigger(Force)	0
9	Number of data	93
10	Maximum	0
11	Minimum	0
12	Average	0
13		
14	Upper limit	0
15	Lower limit	0
16	Result	Invalid
17		
18		
19		
20	Distance(mm)	Force(N)
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0

Header

Measured data

Graph OFF

	A	B
1	Distance(mm)	Force(N)
2	0	0.4
3	0	0.4
4	0	0.4
5	0	0.4
6	0	0.4
7	0.01	0.4
8	0.07	0.5
9	0.14	0.5
10	0.22	0.5
11	0.31	0.5
12	0.41	0.5
13	0.52	0.5
14	0.63	0.4
15	0.75	0.4

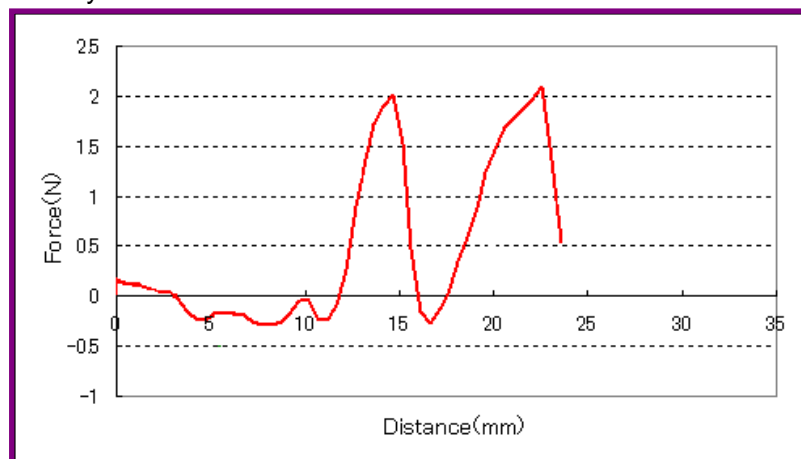
Header

Measured data

### 5.6.3. Graph

After the measurement is finished, the graph is made when the Graph is checked.

The horizontal axis is force, the vertical axis is distance. The measurement data is recorded from start to end position. The data is indicated by red line.

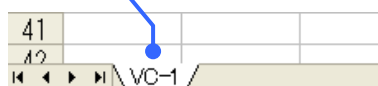
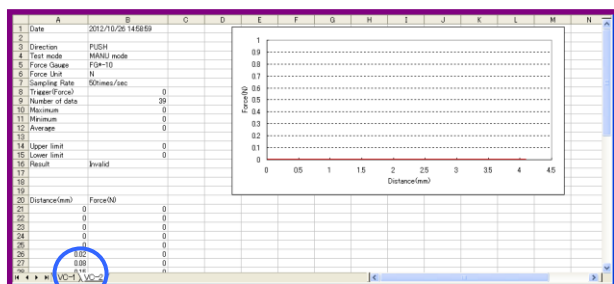


#### 5.6.4. Sheet of each test

##### Graph ON

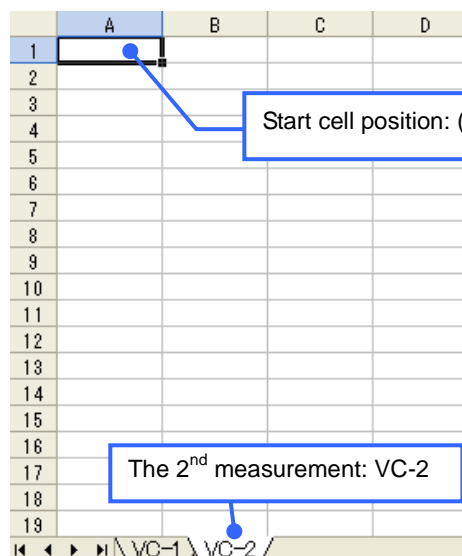
One test is assigned one sheet.

The sheet is named automatically "VC-(serial number)".



The 1<sup>st</sup> measurement: VC-1

次の計測



Start cell position: (1.1)

The 2<sup>nd</sup> measurement: VC-2

##### Graph OFF

Two or more tests will be allocated in one sheet.

After a test is completed, the next row cell position is recorded for the next test. If test is recorded at right end row, the next test will make a new sheet, the sheet is named automatically "VC-(serial number)".

	A	B	C	D
1				
2				
3		Distance(mm)	Force(N)	
4		0	0	
5		0	0	
6		0	0	
7		0	0	
8		0	0	
9		0.02	0	

The 1<sup>st</sup> test

The 2<sup>nd</sup> test

	IS	IT	IU	IV
1				
2	Distance(mm)	Force(N)	Distance(mm)	Force(N)
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0.01	0
9	0.06	0	0.07	0
10	0.12	0	0.13	0
11	0.23	0	0.22	0
12	0.3	0	0.31	0
13	0.42	0	0.41	0
14	0.5	0	0.52	0
15	0.61	0	0.64	0
16	0.73	0	0.76	0
17	0.88	0	0.88	0
18	0.98	0	1	0
19	1.13	0	1.13	0

If test is recorded at right end row, the next test will make a new sheet, The sheet is named automatically "VC-(serial number)".

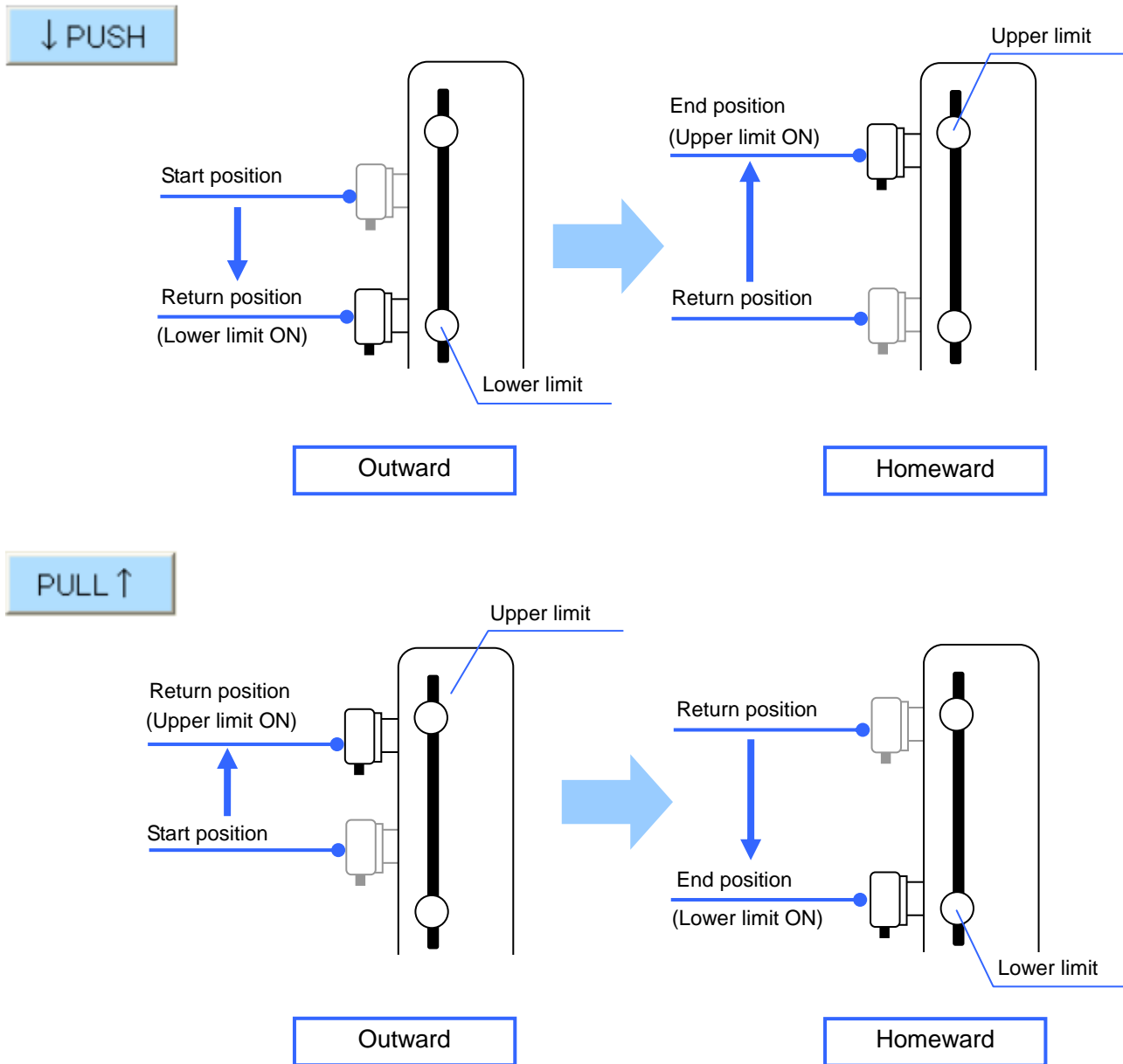
## 5.7. SING mode

### 5.7.1. Operation

This mode of operation is ideal for completing one cycle between manual distance limits. The test stand will only operate between the limits that are set on the test stand.

The test stand will move downward or upward when the respective **PUSH** or **PULL** button is clicked.

The stand will continue to move until one of the following events occurs: the **STOP** button is clicked, one of the manual limit switches is tripped, the emergency reset button is pushed.



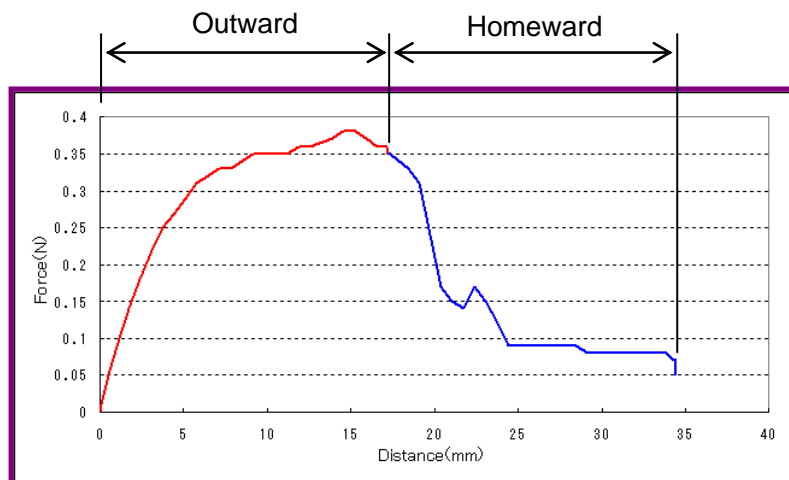
### 5.7.2. Record of Measurement Data

The recorded sheet is the same as the previous MANU mode.

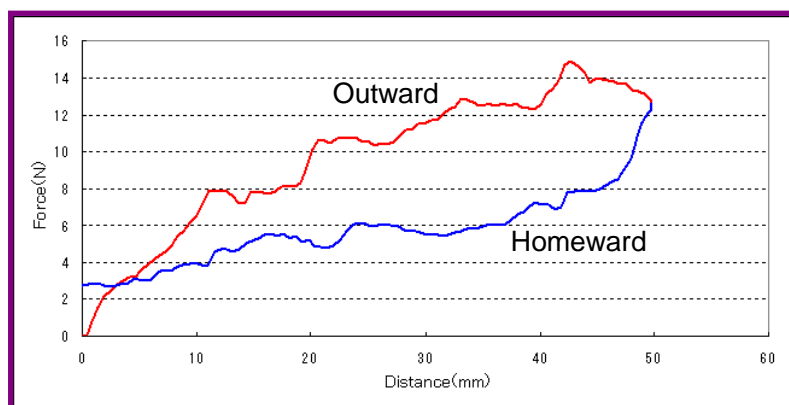
### 5.7.3. Graph

After the measurement is finished, the graph is made when the Graph box is checked.

The horizontal axis is distance, the vertical axis is force. The measurement data is recorded from start to end position, The data is indicated by a red line in outward direction, while a blue line in homeward direction.



Total Distance check button ON



Total Distance check button OFF

### 5.7.4. Sheet of each test

The record sheet is the same as the previous MANU mode.

### 5.7.5. MAX-S Sheet

Only when the SING mode operates, the MAX-S seat is generated. The maximum force data of each operation is recorded in each line of MAX-S sheet. When the SING mode is operated the first time within a BOOK, a MAX-S sheet is made to the left of the current sheet. Only one MAX-S seat is made for one BOOK file.

	A	B	C	D
1	Date	2012/10/26		
2				
3	Force Gauge	FG*-10		
4	Force Unit	N		
5				
6	Maximum	7.9		
7	Minimum	0		
8	Average	2.52		
9	Standard Deviation	2.93		
10				
11	Count	Sheet name	Distance(mm)	Maximum Force
12	1	<a href="#">VC-1</a>	42.17	12.2
13	2	<a href="#">VC-2</a>	28.74	10.68
14	3	<a href="#">VC-3</a>	51.13	10.85
15	4	<a href="#">VC-4</a>	23.92	6.9
16	5	<a href="#">VC-5</a>	42.7	8.61

The mounted force gauge type and the force unit

The statistical result against max force values

The indicated Maximum, Minimum, Average and Standard deviation are calculated by the maximum values of each test.

Maximum force value of each test

Test No.	Sheet	Distance (mm)	Maximum Value
1	<a href="#">VC-1</a>	42.17	12.2
2	<a href="#">VC-2</a>	28.74	10.68
3	<a href="#">VC-3</a>	51.13	10.85
4	<a href="#">VC-4</a>	23.92	6.9
5	<a href="#">VC-5</a>	42.7	8.61

The maximum force value and the distance at that time

The sheet name of the corresponding measurement

Because the cell links the corresponding measurement sheet, it is possible to jump to the sheet by clicking.

The number of consecutive test

	A	B	C	D
1	Date	2012/10/26		
2				
3	Force Gauge	FG*-10		
4	Force Unit	N		
5				
6	Maximum	7.9		
7	Minimum	0		
8	Average	2.52		
9	Standard Deviation	2.93		
10				
11	Count	Sheet name	Distance(mm)	Maximum Force
12	1	<a href="#">VC-1</a>	42.17	12.2
13	2	<a href="#">VC-2</a>	28.74	10.68
14	3	<a href="#">VC-3</a>	51.13	10.85
15	4	<a href="#">VC-4</a>	23.92	6.9
16	5	<a href="#">VC-5</a>	42.7	8.61
17				
18				
19				

▶ \ MAX-S \ VC-1 \ VC-2 \ VC-3 \ ◀
------------------------------------

Each measurement sheet of SING mode

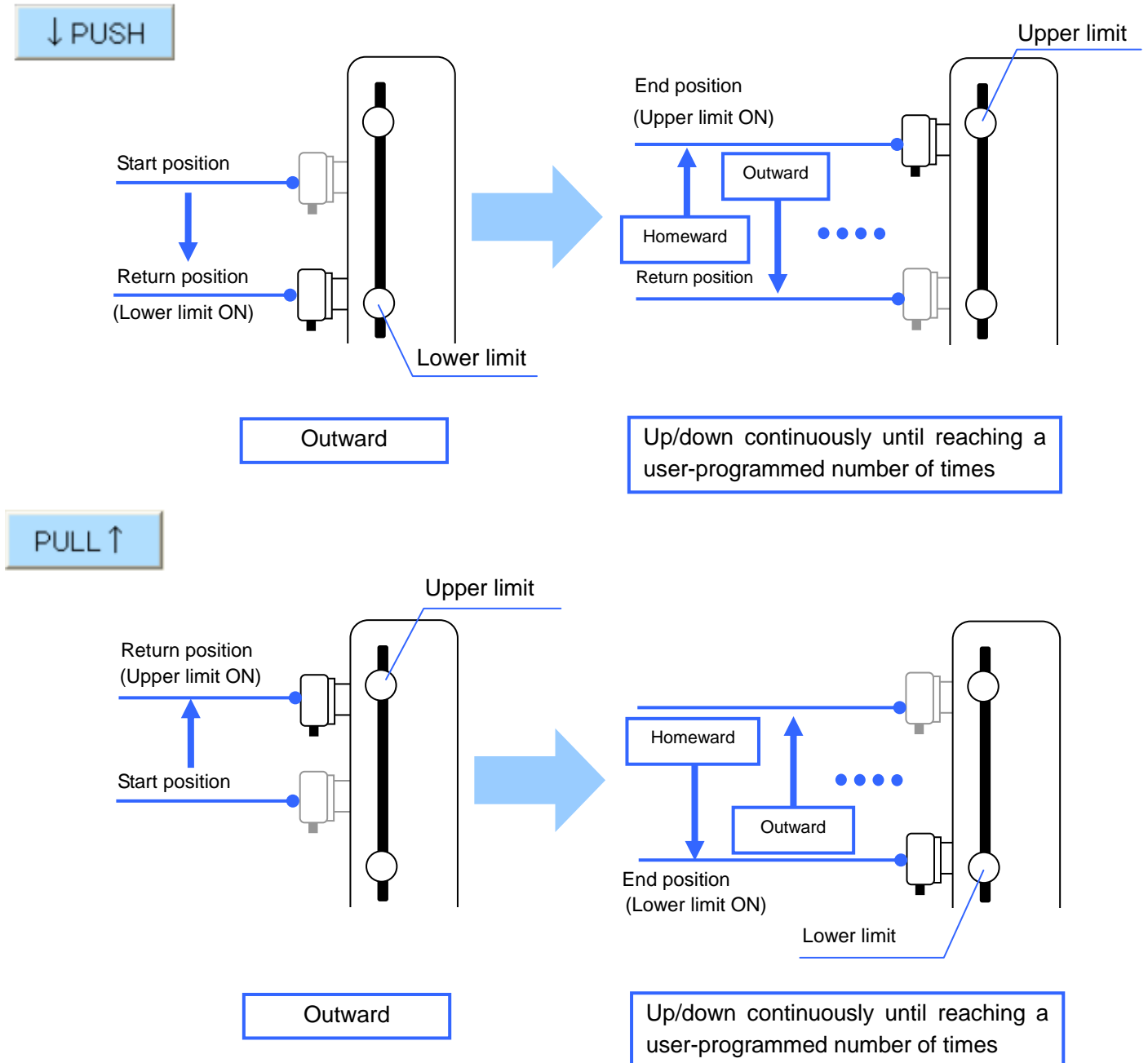
The "MAX-S" sheet is made for the head of the measurement sheets of SING mode

## 5.8. CONT mode

### 5.8.1. Operation

This mode of operation is ideal if the user wants the test stand to repeatedly cycle up and down continuously or for a user-programmed number of times. The stand will start in either direction depending on whether **PUSH** or **PULL** button is clicked.

The stand will continue to move until one of the following events occurs: the **STOP** button is clicked, the emergency reset button is pushed.



### 5.8.2. Record of Measurement Data

The record sheet is as follows:

Graph ON

	A	B
1	Date	2012/10/26 15:54:05
2		
3	Direction	PUSH
4	Test mode	CONT mode
5	Force Gauge	FG*-10
6	Force Unit	N
7	Sampling Rate	50times/sec
8	Repeat Count	5
9	Sampling Number	5
10	Trigger(Force)	0
11	Number of data	392
12	Maximum	1.8
13	Minimum	0
14	Average	0.44
15		
16	Upper limit	0
17	Lower limit	0
18	Result	Invalid
19		
20	Count	1
21	MAX Sheet	<a href="#">MAX-1</a>
22		
23		
24	Distance(mm)	Force(N)
25	0	0
26	0	0
27	0	0
28	0	0

Header

Measurement data

Graph OFF

	A	B	C
1	Distance(mm)	Force(N)	
2	0	0	
3	0	0	
4	0	0	
5	0	0	
6	0	0	
7	0.01	0	
8	0.07	0	
9	0.14	0	
10	0.22	0	
11	0.31	0	
12	0.41	0	
13	0.52	0	
14	0.64	0	
15	0.75	0	

Header

#### Sampling Number

The measurement sheets are made by the setting of the Sampling Number which is explained at chapter 5.5. measuring. In case of the measurement which is not recorded in the sheet, the maximum value only is recorded in the MAX sheet.

#### Count

The Count which is displayed in the header at Graph ON is how many times testing continuously.

#### MAX sheet

When the test is continuously done, the maximum value at each test is recorded in the MAX sheet line by line. The MAX sheet and respective data sheets have hyperlinks allowing quick linkage back and forth between their corresponding linked data.

Refer to the following clause for a detailed content.

#### Graph

In CONT mode, the graph is made in the measurement sheet regardless of the setting of Graph ON/OFF.



### 5.8.3. MAX sheet

When the test is continuously done, the maximum value at each test is recorded in the MAX sheet line by line. The MAX sheet in the CONT mode is as follows.

	A	B	C	D
1	Date	2012/10/26		
2				
3	Force Gauge	FG*-10		
4	Force Unit	N		
5				
6	Maximum	3.5		
7	Minimum	1.8		
8	Average	2.68		
9	Standard Deviation	0.64		
10				
11	Repeat Count	5		
12	Sampling Number	5		
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26	Count	Sheet name	Distance(mm)	Maximum Force
27	1	<a href="#">VC-1</a>	50.73	10.16
28	2	<a href="#">VC-2</a>	49.66	14.05
29	3	<a href="#">VC-3</a>	44.31	8.12
30	4	<a href="#">VC-4</a>	47.52	8.48
31	5	<a href="#">VC-5</a>	51.21	5.73

The mounted force gauge type and the force unit

The statistical result against max force values

The indicated Maximum, Minimum, Average and Standard deviation are calculated by the maximum values of each test.

The Count and the Sampling Number are indicated by user-programmed values in FGS-VC.

The maximum force value and the distance at that time

Maximum force value of each test

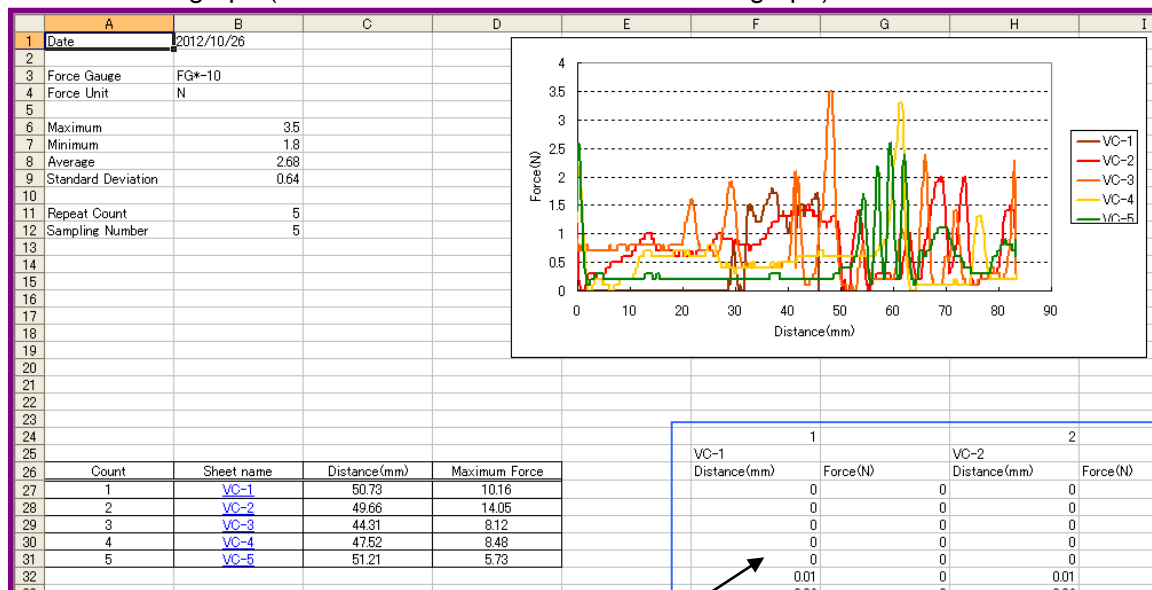
Test No.	Sheet	Distance (mm)	Maximum Value
1	<a href="#">VC-1</a>	50.73	10.16
2	<a href="#">VC-2</a>	49.66	14.05
3	<a href="#">VC-3</a>	44.31	8.12
4	<a href="#">VC-4</a>	47.52	8.48
5	<a href="#">VC-5</a>	51.21	5.73

The sheet name of the corresponding measurement  
Because the cell links the corresponding measurement sheet, it is possible to jump to the sheet by clicking.

The number of consecutive test

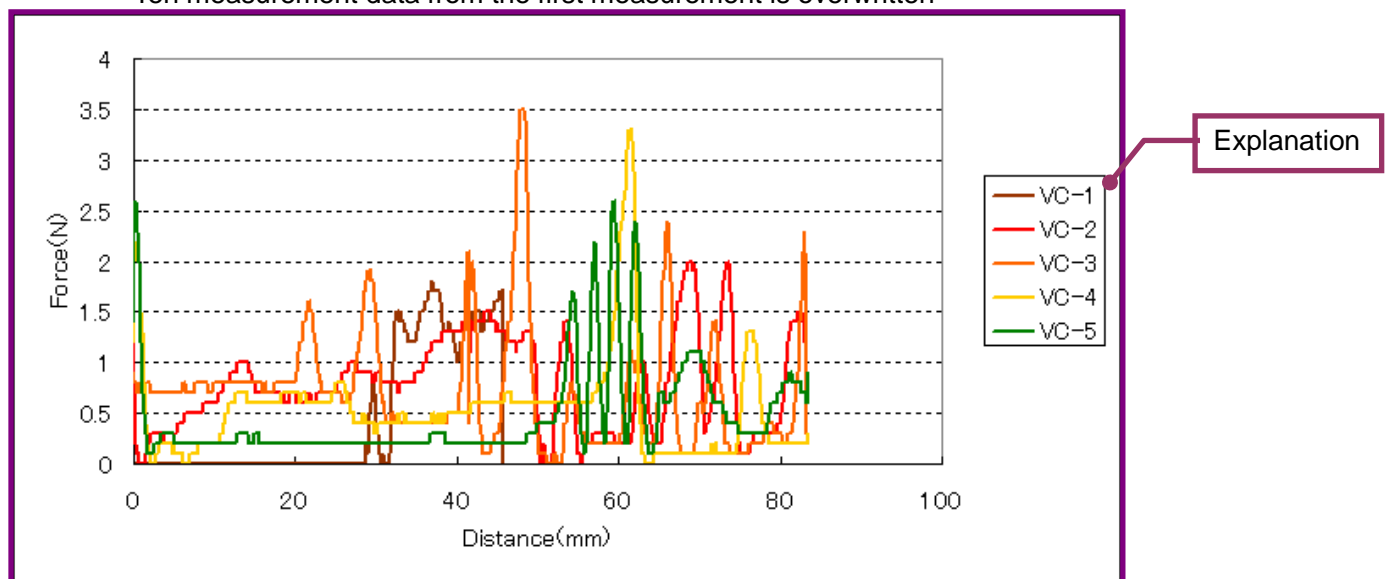
#### 5.8.4. Graph of MAX sheet

When the Graph is ON, each measurement graph is overwritten in the MAX sheet. In the graph, only ten measurement data from the first measurement is overwritten. The measurement data used for the graph is written under the graph (Measurement data for the overwritten graph).



Measurement data for the overwritten graph

Ten measurement data from the first measurement is overwritten



#### 5.8.5. Sheet of each test

It is almost same as MANU mode, refer to 5.6.4. Sheet of each test.

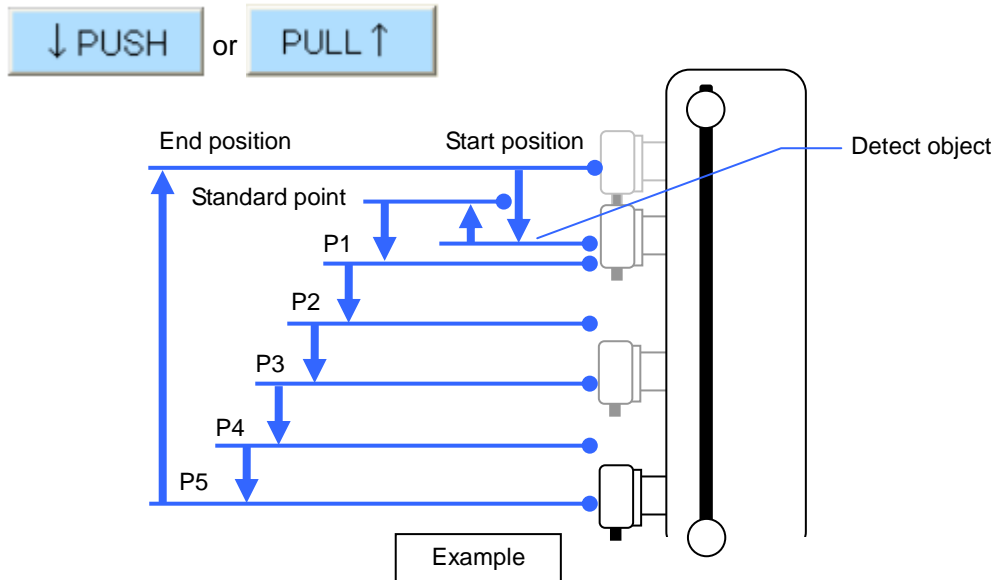
However, when beginning to operate in CONT mode, the MAX sheet is newly made.

## 5.9. PROG mode

### 5.9.1. Operation

This mode of operation is ideal if user wants the test stand to be programmed with complex movements (Refer to the FGS-VC instruction manual.)

The test stand will start to move and download measurement data when the **PUSH** or **PULL** button is clicked. The parameter of the PROG mode can not be set in this software. The users should set the parameter by FGS-VC.



### 5.9.2. Record of Measurement Data

The record of the measurement data is same as CONT mode. In PROG mode, the measurement data is recorded from Standard point to P5.

### 5.9.3. Comparator

The comparator function is same as MANU mode. In PROG mode, the comparator is judged by the maximum force from Standard point to P5.

### 5.9.4. MAX sheet

The MAX sheet is same as CONT mode.

### 5.9.5. Graph of MAX sheet

It is same as CONT mode.

### 5.9.6. Sheet of each test

It is almost same as MANU mode, refer to 5.6.4. Sheet of each test. However, the MAX sheet is newly made at each completing repeat count.

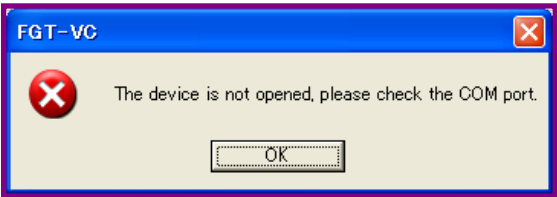
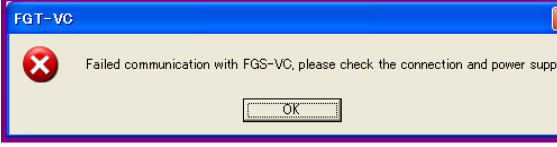

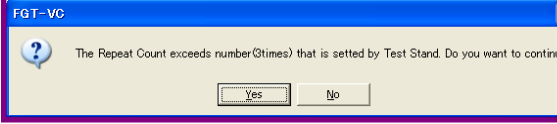
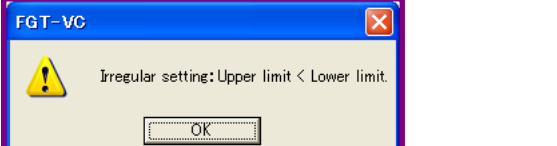
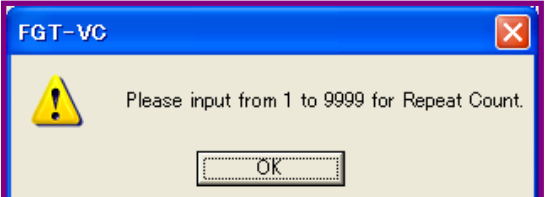

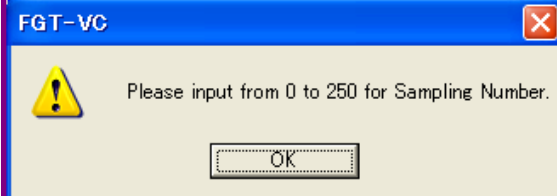
## 6. Input Range

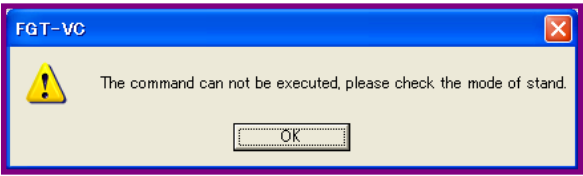
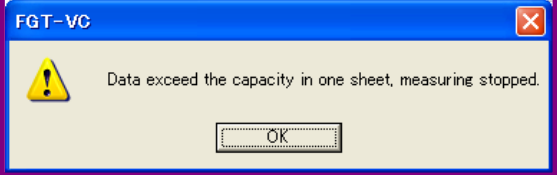

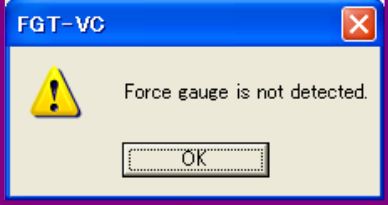


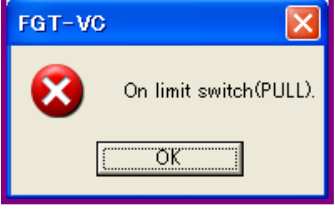
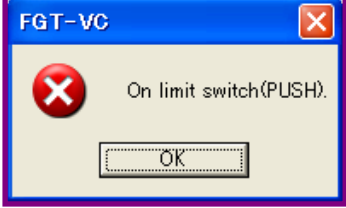
The input range of force depends on the mounted force gauge.

The range of each force gauge is follows:

Model	Unit	Upper limit	Lower limit	Trigger
FG * -0.5	N	0 – 2.000		
	g	0 – 200.0		
	lb	0 – 0.500		
	oz	0 – 8.000		
FG * -0.1	N	0 – 5.000		
	g	0 – 500.0		
	lb	0 – 1.000		
	oz	0 – 16.00		
FG * -2	N	0 – 10.00		
	g	0 – 1000		
	lb	0 – 2.000		
FG * -5	N	0 – 20.00		
	Kg	0 – 2.000		
	lb	0 – 5.000		
FG * -10	N	0 – 50.00		
	Kg	0 – 5.000		
	lb	0 – 10.00		
FG * -20	N	0 – 100.0		
	Kg	0 – 10.00		
	lb	0 – 20.00		
FG * -50	N	0 – 200.0		
	Kg	0 – 20.00		
	lb	0 – 50.00		
FG * -100	N	0 – 500.0		
	Kg	0 – 50.00		
	lb	0 – 100.0		
FG * -200	N	0 – 1000		
	Kg	0 – 100.0		
	lb	0 – 200.0		
FG * -500HXY	N	0 – 2500		
	Kg	0 – 250.0		
	lb	0 – 500.0		

## 7. Message of Error

	<p>The device is not opened. Please check the COM port. Refer to 4.4. Confirmation of COM Port.</p>
	<p>Failed communication with FGS-VC and your PC. Please check the connection of the USB cable. Please check that the stand's power is ON.</p>
	<p>The stand is operating or the stand is not in the home screen, but in parameter setting mode. Please stop the operation of the stand by STOP, or exit the parameter setting mode.</p>
	<p>The repeat count of PC is larger than FGS-VC. In this case FGS-VC starts to measure, however please note that the repeat count can be executed only up to the setting repeat count of the stand.</p>
	<p>The Upper limit is smaller than the Lower limit. The Upper limit should be equal or larger than the Lower limit.</p>
	<p>Exceeding the input range of the Repeat Count. The range is from 1 to 9999.</p>
	<p>The Trigger is wrong. The setting value of trigger distance should be from 1 to 400.0.</p>
	<p>When the Graph is ON, the Sampling Number should be from 0 to 250.</p>

	<p>The stand can not be operated. Please confirm the operation mode of the stand. The mode should be MANU, SING, CONT or PROG mode.</p>
	<p>The number of measuring data points that can be recorded on the sheet is exceeded. Please make a new Book file or sheet.</p>
	<p>The emergency switch of the stand is turned on. Please conform a safe condition exists. Then please turn the emergency switch off.</p>
	<p>Please check the force gauge's power is on. Please confirm the connection with the stand and the force gauge is properly connected.</p>
	<p>The overload of PULL direction has occurred. Please move to PUSH direction to release the overload.</p>
	<p>The overload of PUSH direction has occurred. Please move to PULL direction to release the overload.</p>
	<p>The PULL limit switch is on. Please move to PUSH direction, or adjust the position of the PULL limit switch.</p>
	<p>The PUSH limit switch is on. Please move to PULL direction, or adjust the position of the PUSH limit switch.</p>