Nidec
All for dreams

98815B

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.

Index

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 or call local Shimpo's corporate office.

2. Software Requirements and Initial Information

The FGT-VC is an Add-in tool for Microsoft Excel 2016.
This tool allows data to be collected and downloaded via USB cable, which in turn tabulates the data to useful information.

Software requirements:

- Windows® 10 (64bit)
- Microsoft Excel® 2016 (32bit/64bit)

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
- Statistical calculations
- Set trigger function

*Microsoft, Windows and Excel are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

3. Reminders

Caution: Warns of important safety information.

Reminder: Notes important information on the product.

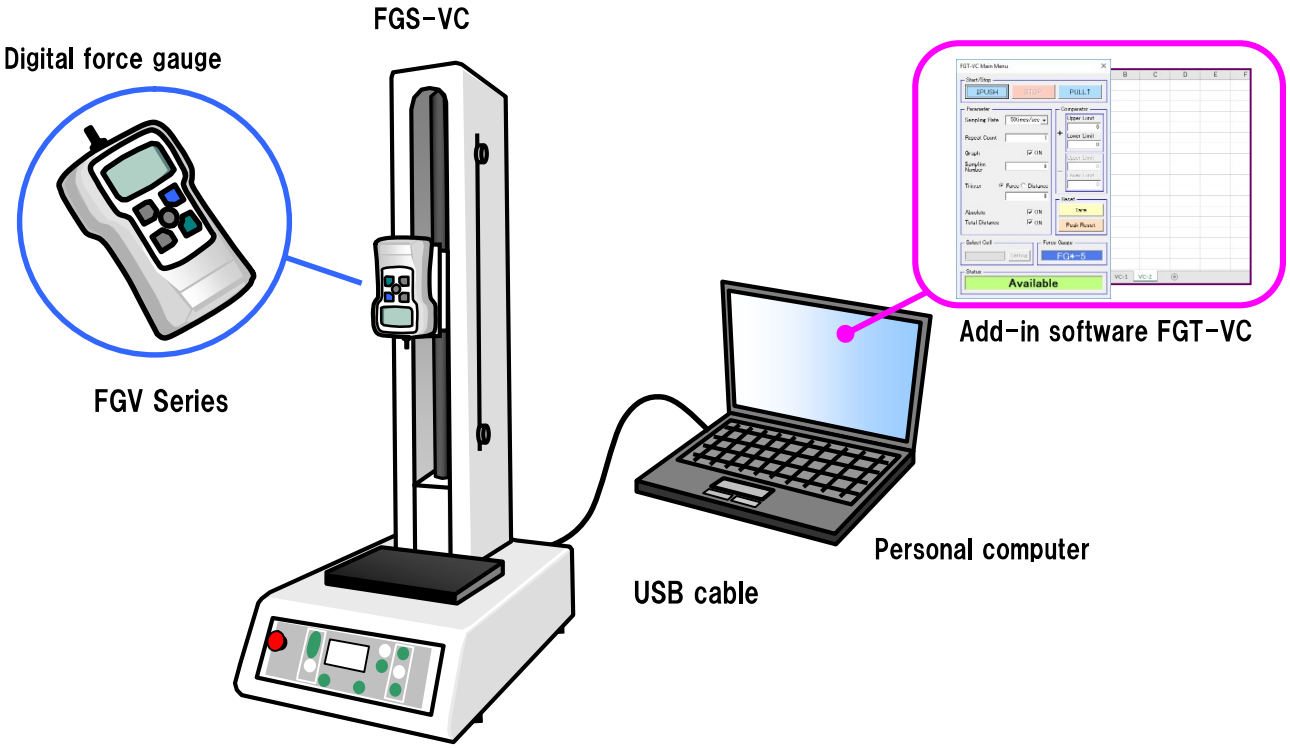
The foregoing warranties are exclusive and in lieu of all other express and implied warranties (except of title including but not limited to implied warranties of merchantability, fitness for a particular purpose, performance, or otherwise), and in no event shall the Company be liable for claims (based 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?

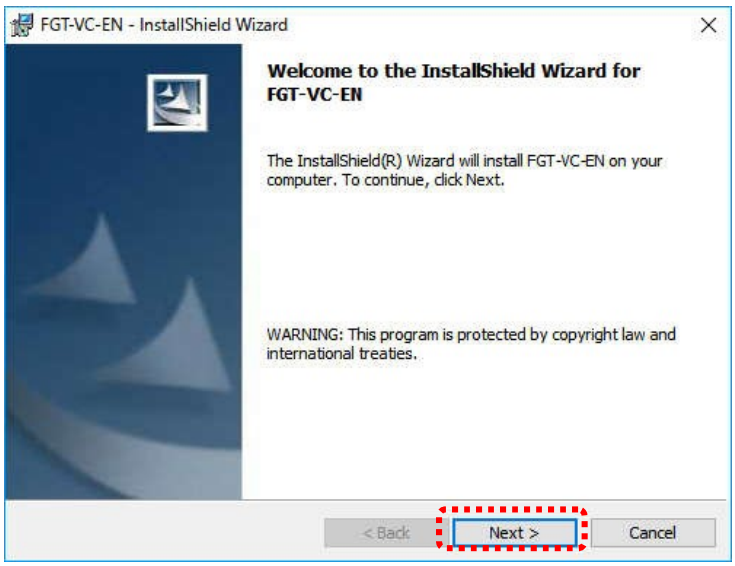
- A copy of the FGT-VC software, this software can be downloaded from www.shimpoinst.com.
- Visit this website for future and additional updates.
- USB cable plugged in to an open port from the Host PC.
- USB port 1.1 or higher.
- Microsoft Excel 2016 (these versions include the necessary libraries needed to make the software operate).

Structure

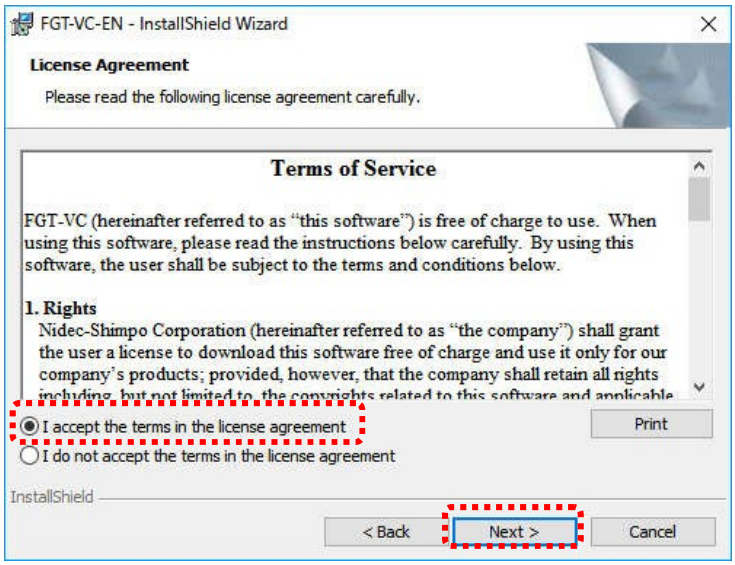


4.1. Install Procedure of FGT-VC Application Software

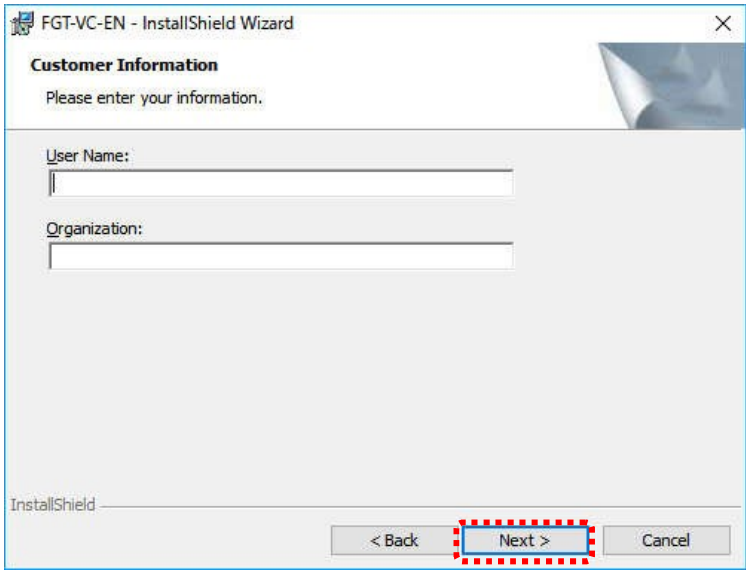
Double click the FGT-VC-EN_v***.msi
The Windows installer is started.
*The software name is different depending on the version.



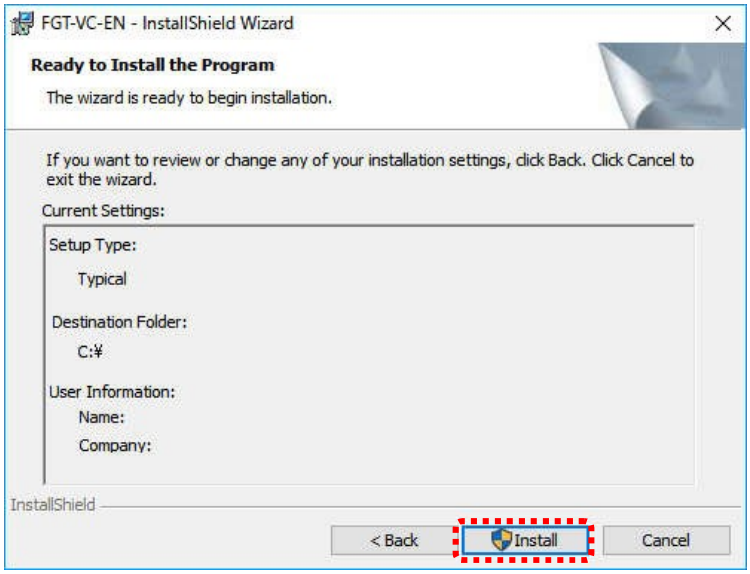
Click “Next >”.



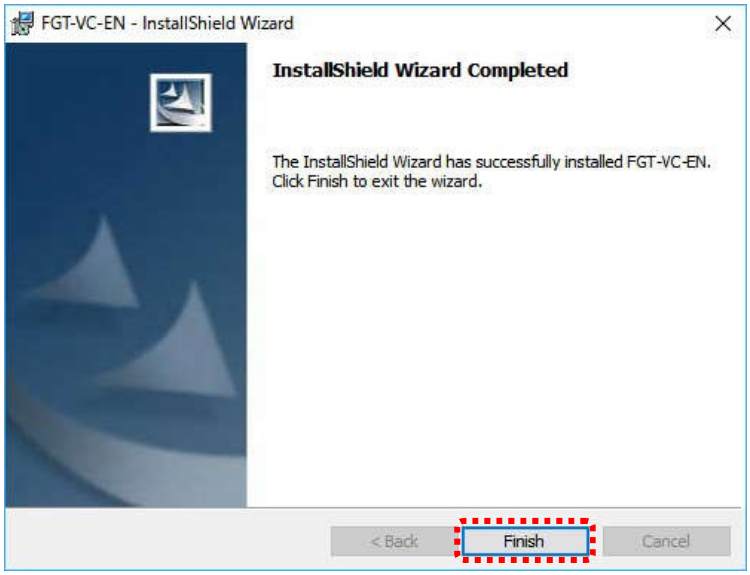
Read the Terms of Service.
If you agree, set the check button of “I accept……”, next click “Next >”.



Fill in User Name and Organization.
Click “Next >”.

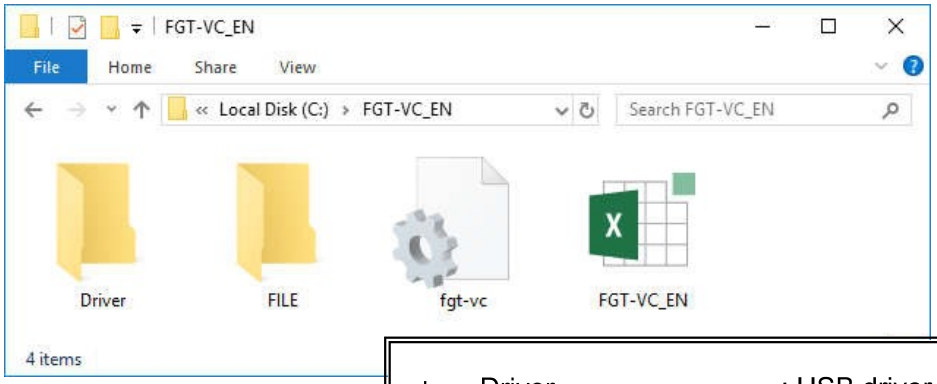


Confirm indicated items.
Click “Install”.



When complete to install, click “Finish”.

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



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

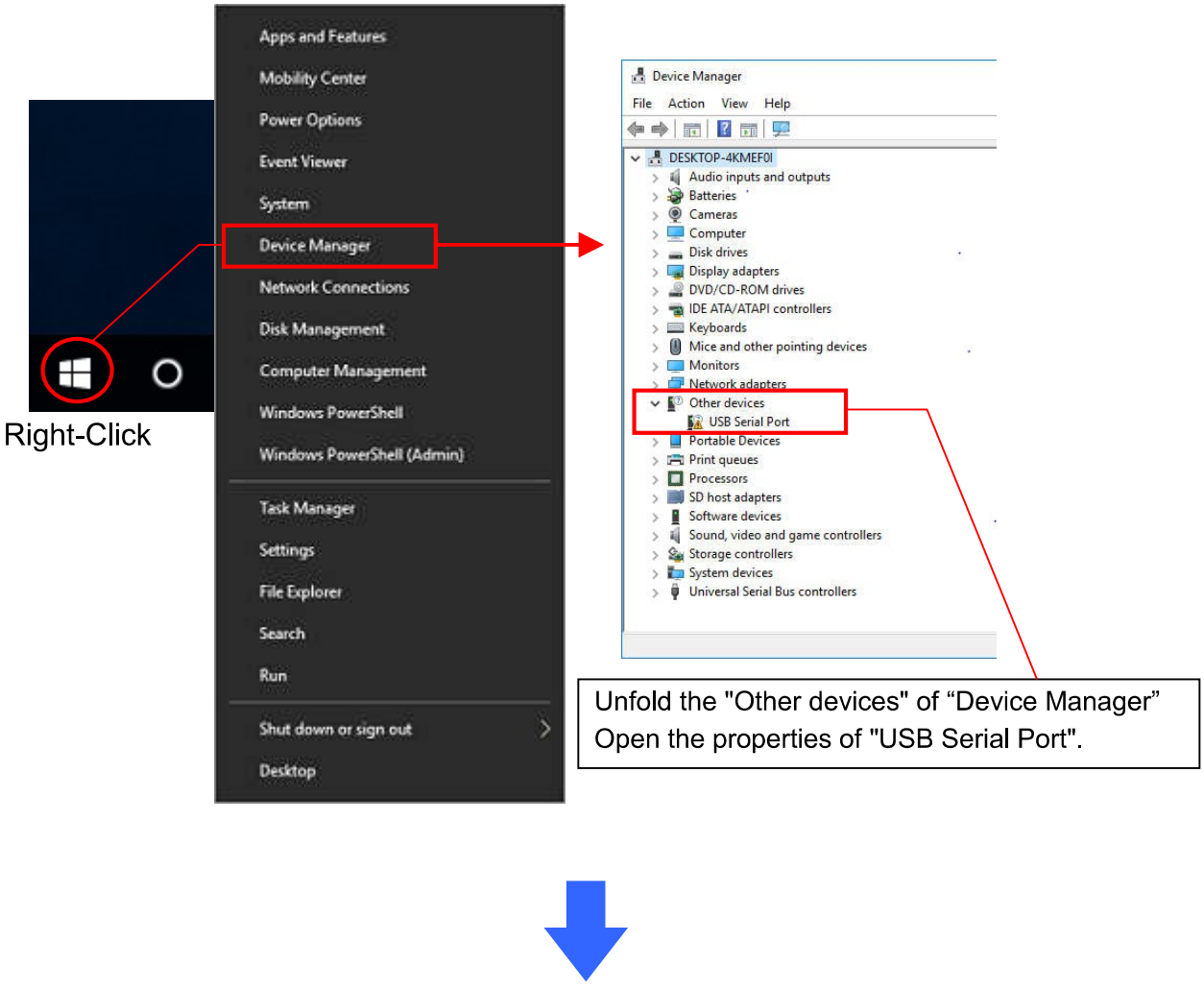
Do not change the content or move the Driver folder and fgt-vc.ini.
The software might not operate properly.

4.2. Install Procedure of USB Driver for FGT-VC

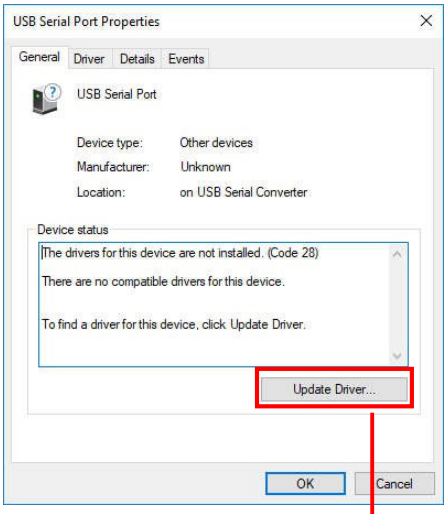
When the FGT-VC is turned on, connect the USB cable to the USB port on the PC.
The driver's installation method slightly differs depending on the PC environment.
Perform installation according to the PC environment specifications below.

Installation for Windows10

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

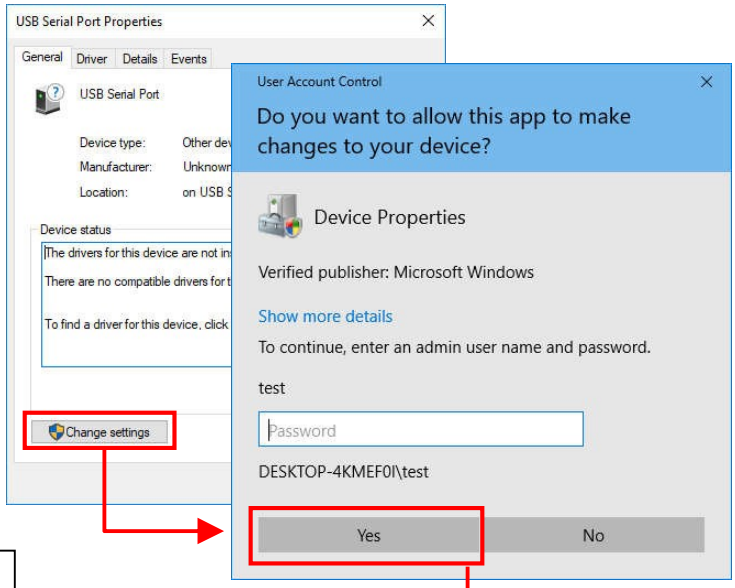


●Administrator authority

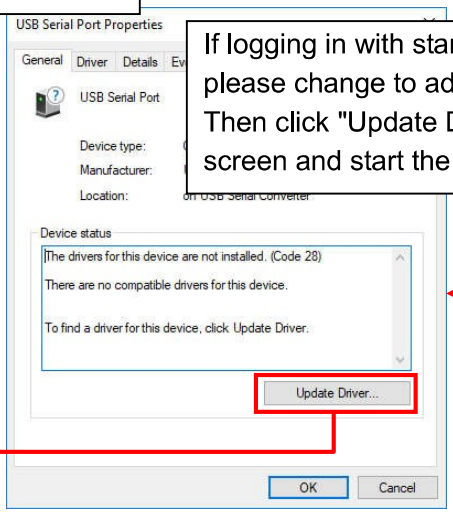


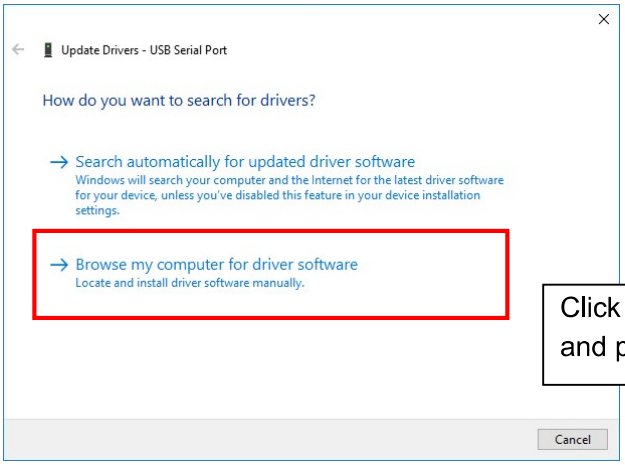
Click "Update Driver" on the property screen, Start the driver updating.

●Standard user authority

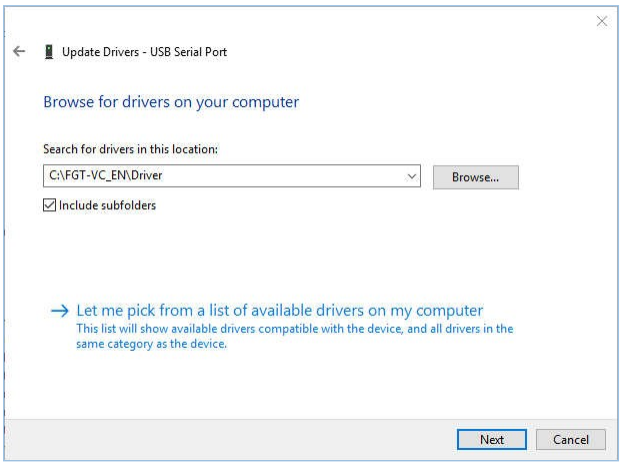


If logging in with standard user authority, please change to administrator authority at first. Then click "Update Driver" on the property screen and start the driver updating.

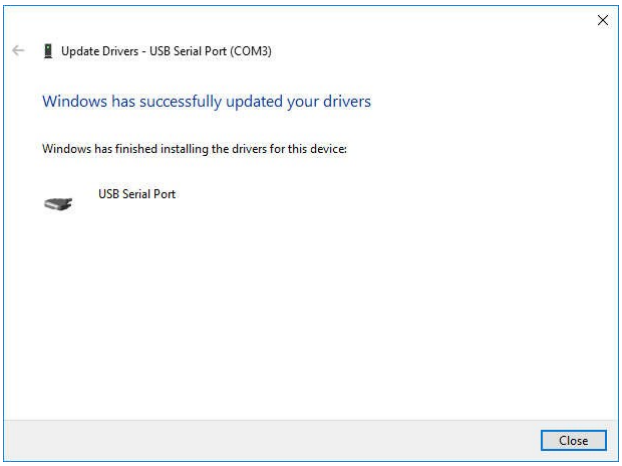




Click "Browse my computer for driver software" and proceed to the next.



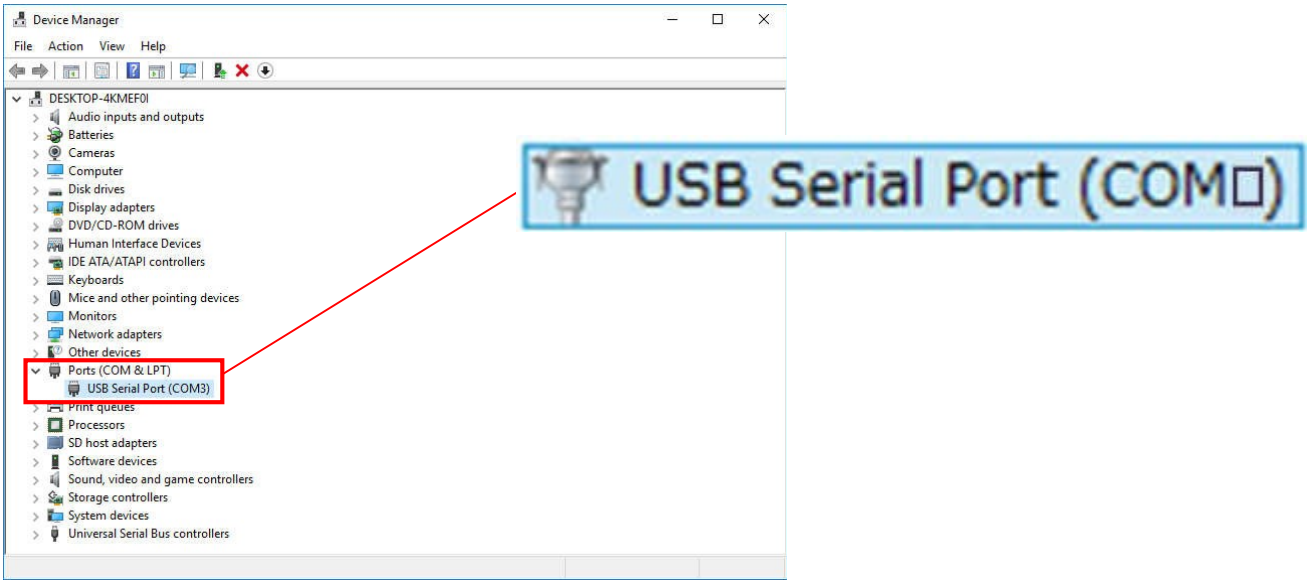
Select "C:\FGT-VC_EN\Driver" from "Browse" and click "Next"



After installation is completed, the above screen will be displayed. Please click "Close" to finish.

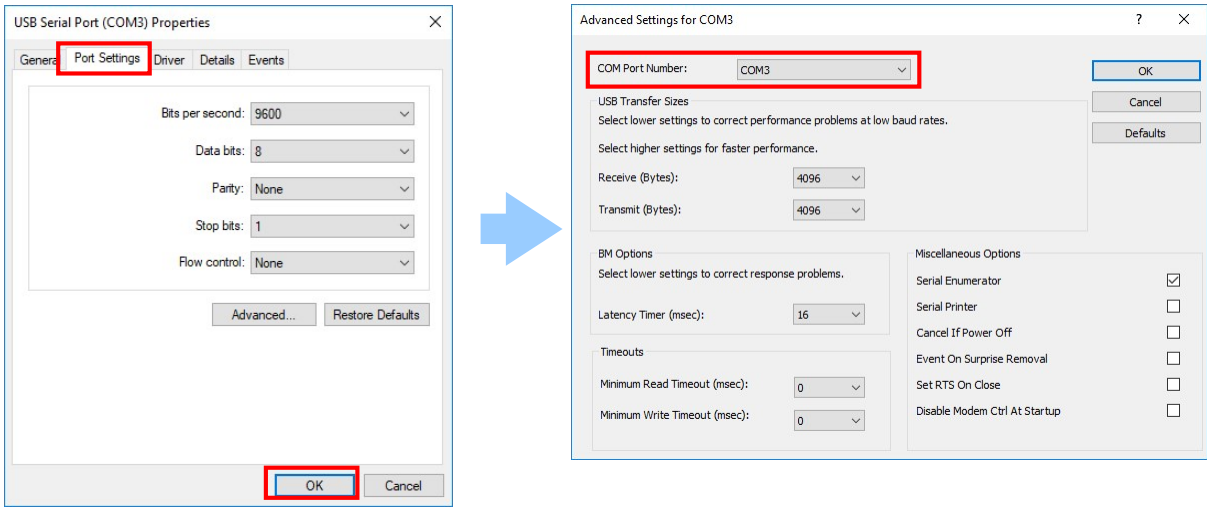
●Confirming COM port number

Check the assigned COM port on the device manager.



●Changing the COM port number

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

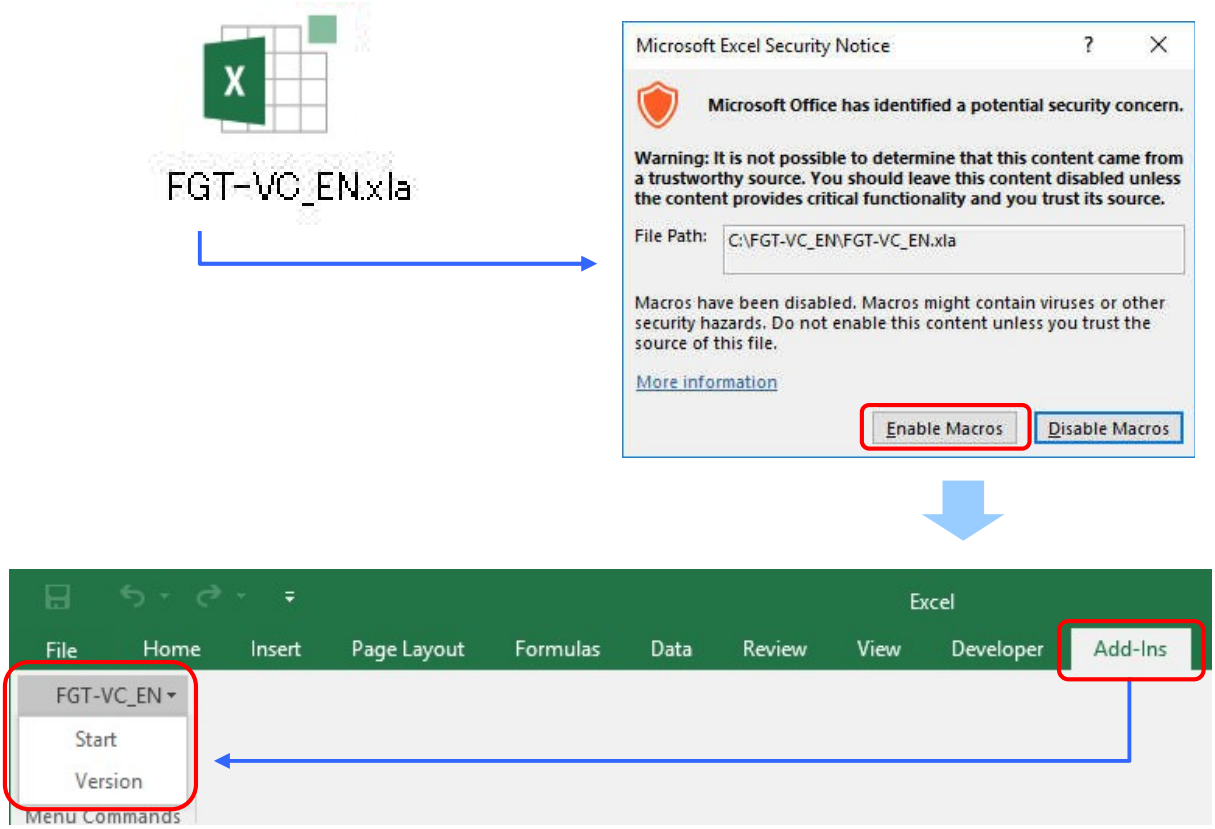


5. Adding the FGT-VC Software

5.1. Startup

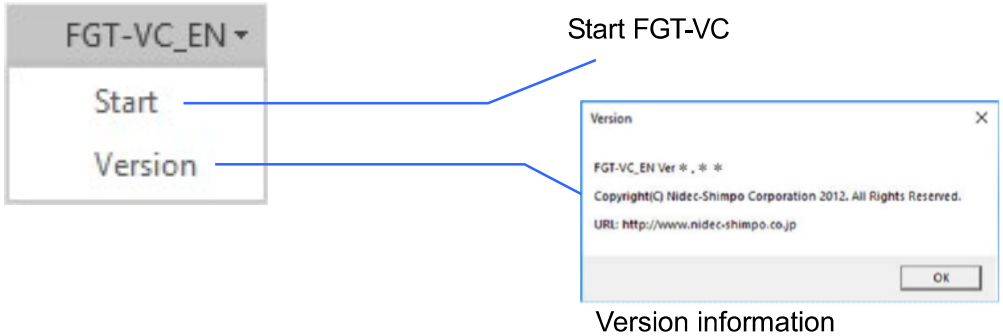
Double click the "FGT-VC_EN.xla" file in the " FGT-VC_EN " folder under the C:\ directory.
The Excel screen is launched.

● The enable/disable macros selection window is displayed when this software starts. Select "Enable Macros (E)".
"Add-Ins" is added on the menu bar of Excel screen, and in it the ” FGT-VC_EN” menu can be selected.



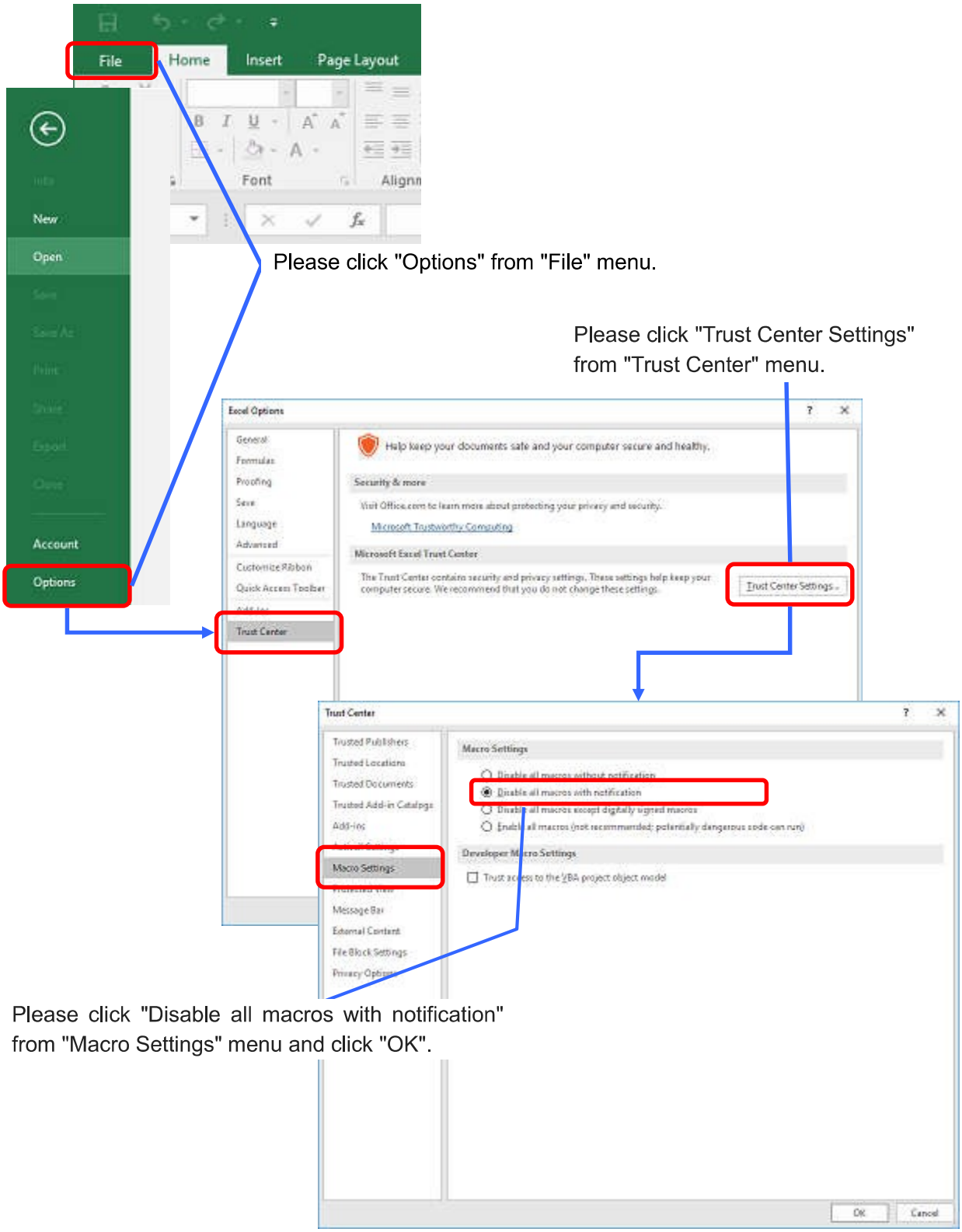
● Connect the TNP and PC, turn on the TNP, and open a new book file. Then,
select "Start" from the ” FGT-VC_EN” menu added in the Excel menu to start “FGT-VC”.

● Select "Version information" to check the software version.



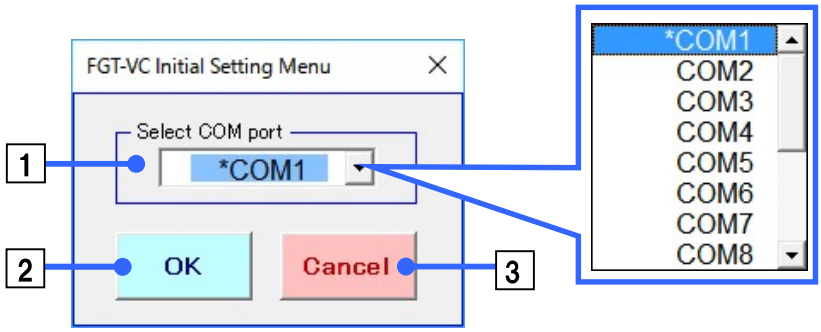
Version information

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



5.2. Initial Dialog

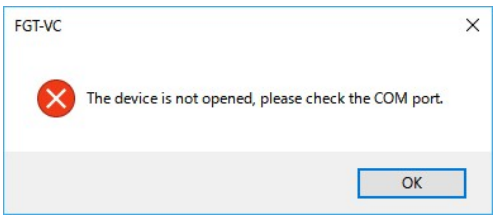
When the software starts the initial screen will appear.
Note: Gauge must be connected and powered on, otherwise an error message will appear.



1	Selection COM port	Select the COM port number in the list box. The program should automatically 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.

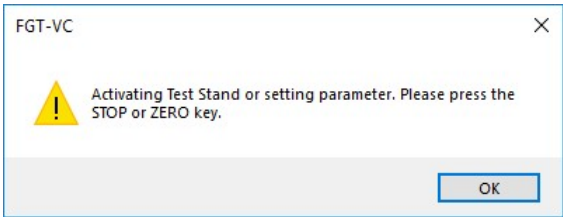
After clicking the OK button, if the PC does not communicate properly with the FGS-VC, the main menu will not appear.
Possible issues.

1. COM port numbers may not coincide, or the PC is not connected with FGS-VC.



2. FGS-VC power may be off.

3. The FGS-VC is moving or the operation mode is in 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:/FGT-VC_EN/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 .xlsx

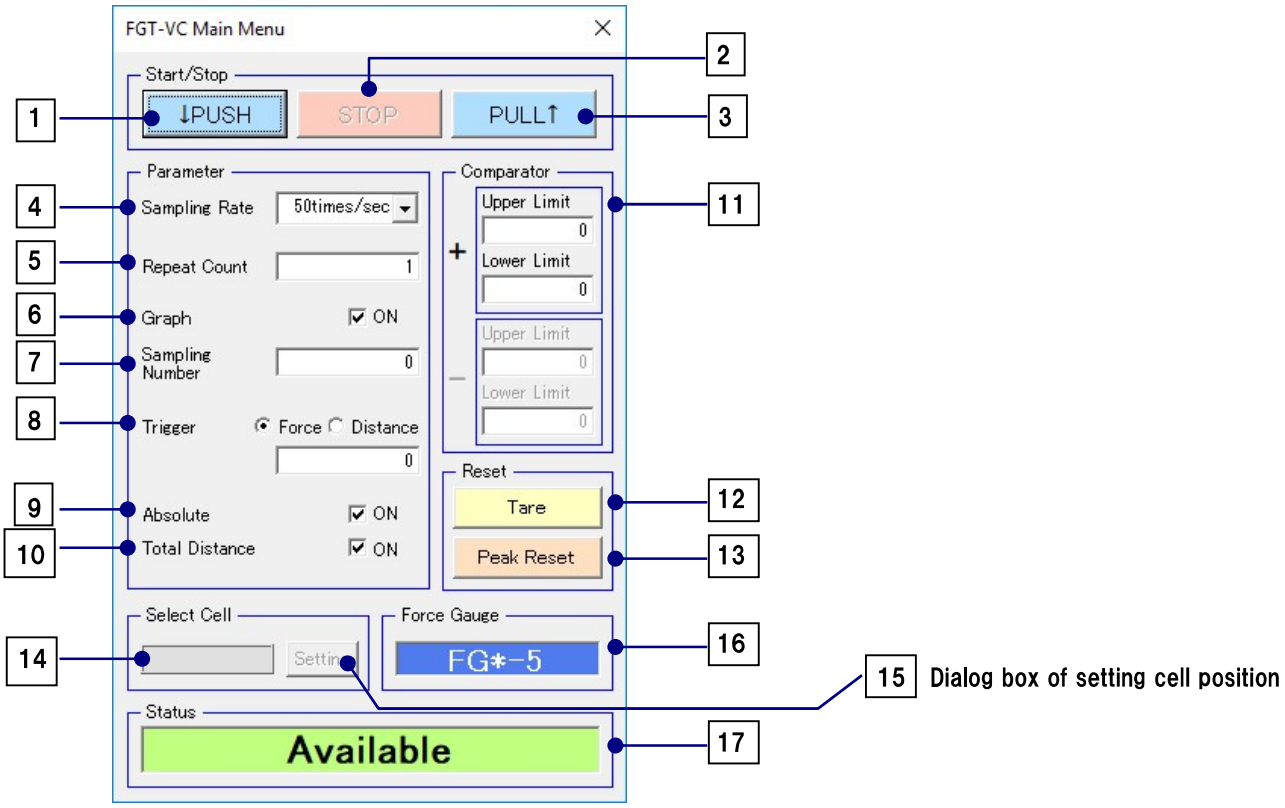
Example: **VC20180401-2.xlsx**
2nd file made on April 1st, 2018.

Sheet Name

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

Example: **VC-17**
17th test data set within a file.

5.4. Main Menu



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 of 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	Distance	If $\lvert Distance \rvert \geq Trigger$, measurement begins.	0.00 - 15.70	
		Force	If $\lvert Force \rvert \geq Trigger$, measurement begins.	Depends on force gauge's range.	
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.	Depend on the mounted force gauge's range.
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	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.	

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.
Only the stand keypad can operate the FGS-VC test stand in Jog mode.

5.5. Measuring

Clicking PUSH or PULL button in the main menu, FGS-VC starts measuring.

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 guaranteed to be accurate.

Maximum measurement data

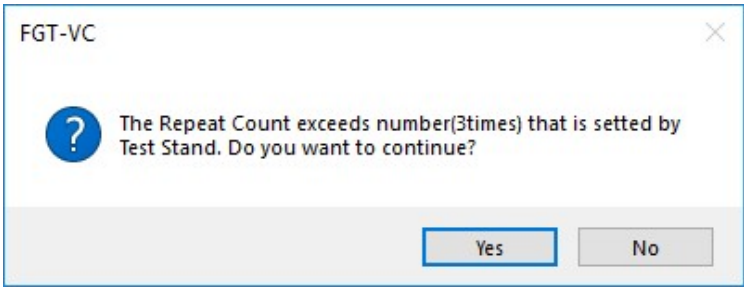
The maximum measurement data of one operation (count) is 32,000 data with Graph on and 65,535 with Graph off.
When the input cell in Excel exceeds the limitation, the error message occurs and can not measure.

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 a 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 with 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.

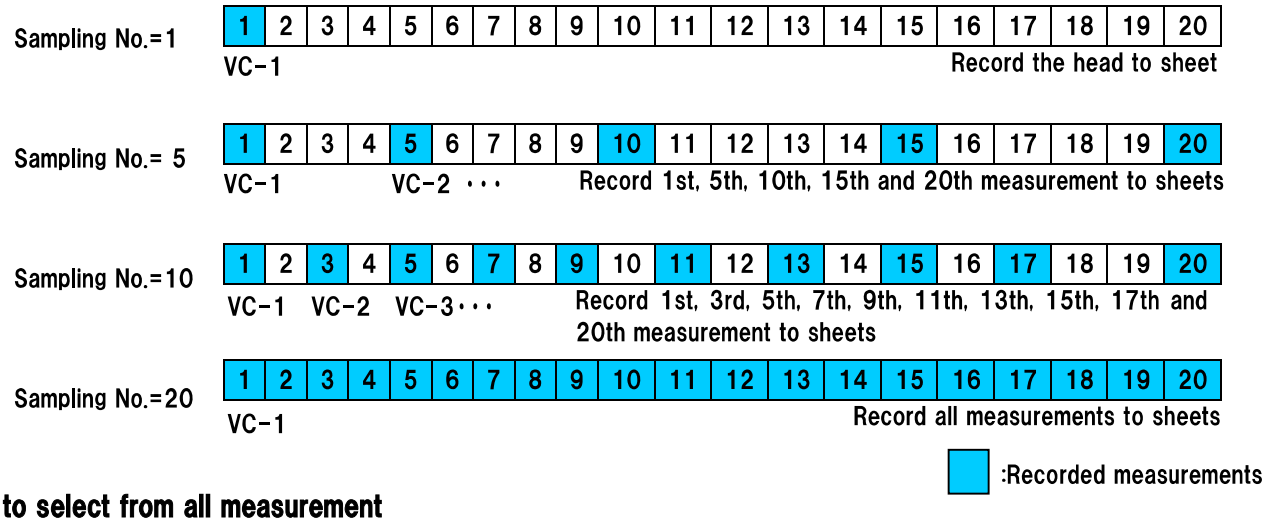


In this case the FGS-VC starts to measure, however please note that the repeat count can be executed only up to the repeat count setting on the FGS-VC stand.

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 cannot be obtained due to the limitation of the 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)



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.

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

Define

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

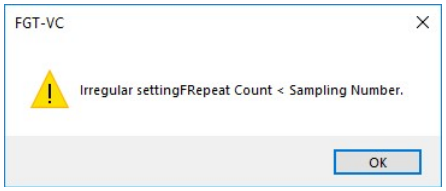
According to equation (1), let the recorded measurement be $B(1), B(2), \cdots, B(x)$, $B(c)$th measurement data is:

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

c: 1 to *x*

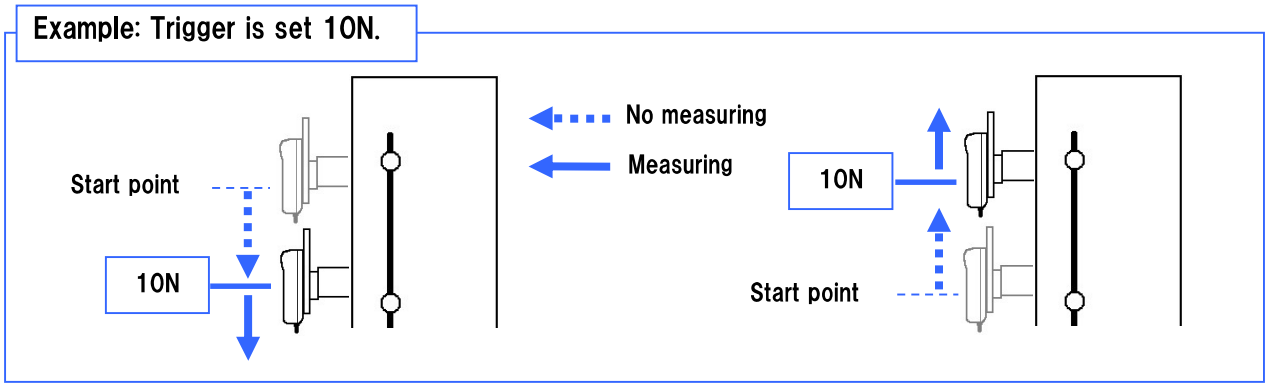
A first and last measurement is always recorded.
If the Sampling Number is 0, all measurement is recorded.

The Sampling Number cannot have a value larger than the Repeat Count.
If the wrong value is set, the following message box will appear.



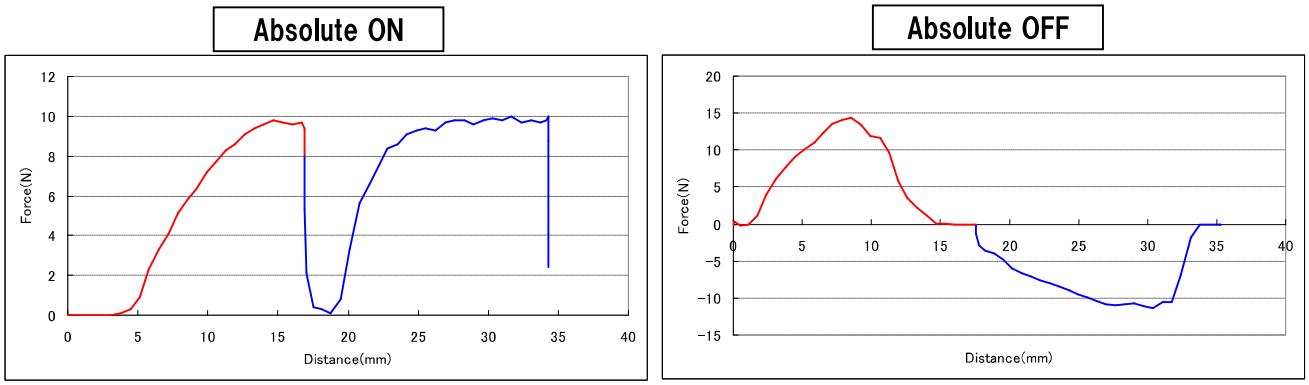
Trigger

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.



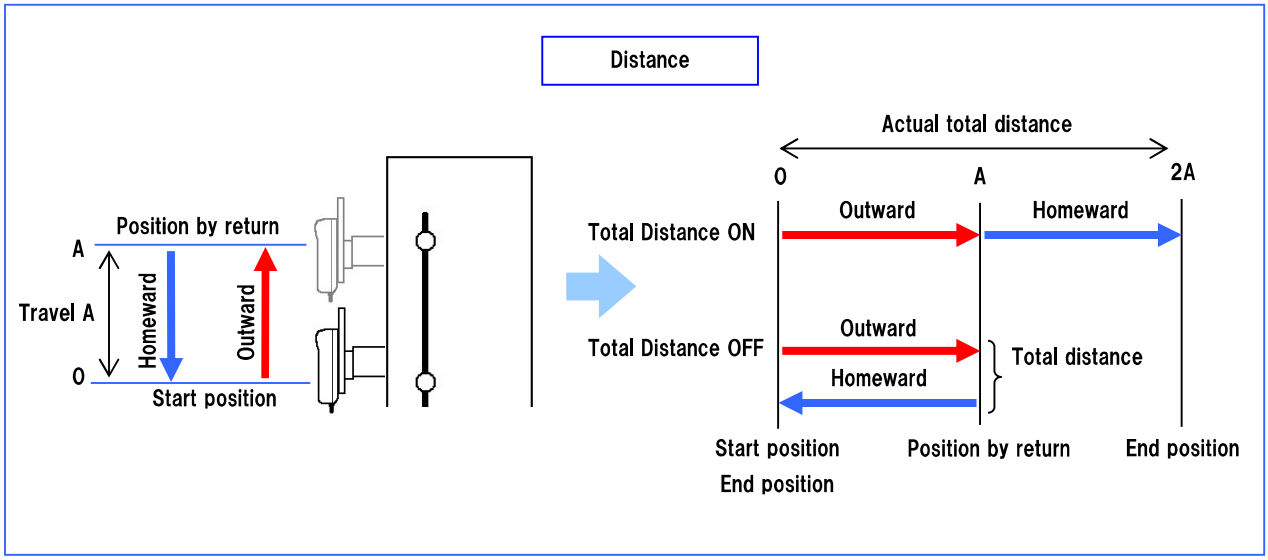
Absolute

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

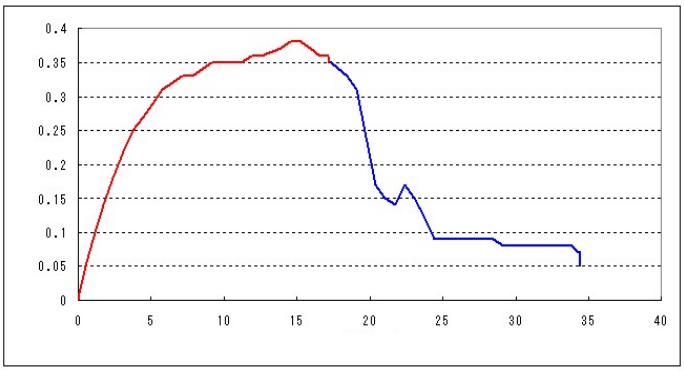


Total Distance

If the Total Distance button is checked, the distance indicates total movement.
If OFF, the distance indicates absolute or round trip of the movement.
This function is available in SING, CONT and PROG mode.



Total Distance ON



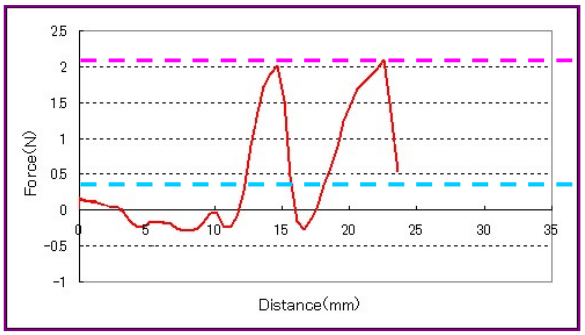
Total Distance OFF

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
$(Lower\_Limit) \le (Maximum\_Value) \le (Upper\_Limit)$	OK
$(Upper\_Limit) < (Maximum\_Value)$	HIGH
$(Lower\_Limit) > (Maximum\_Value)$	LOW

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

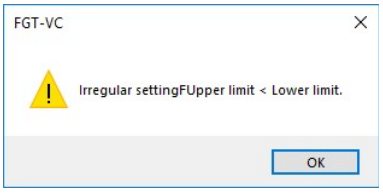


Upper Limit: Short dashed line of pink

Lower Limit: Short dashed line of light blue

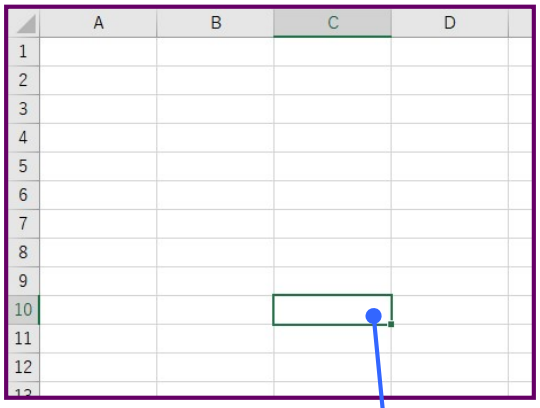
The Upper and Lower Limit can not be input $(Upper\_Limit) < (Lower\_Limit)$.

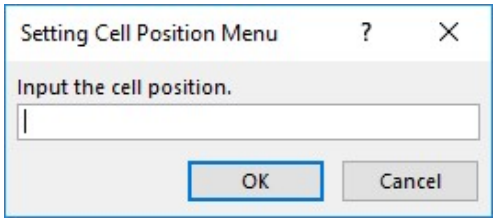
If the wrong value is set, the following message box will be indicated.



Select Cell

The Select Cell is available when the Graph check box is OFF.
If the Graph is ON, the cell position fixes (A1).
When the Setting button has the Graph OFF, the following input dialog is displayed.





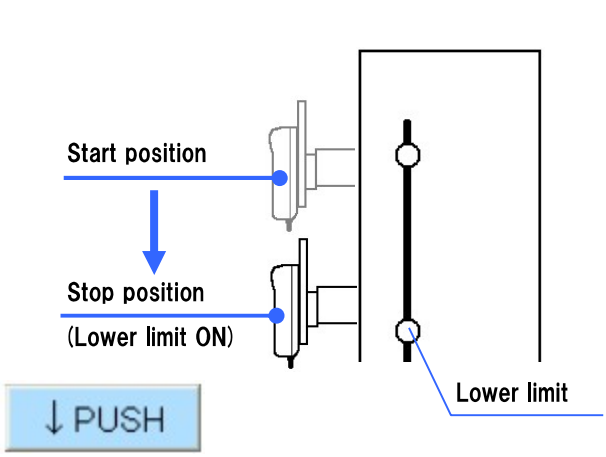
Setting Cell Position Menu

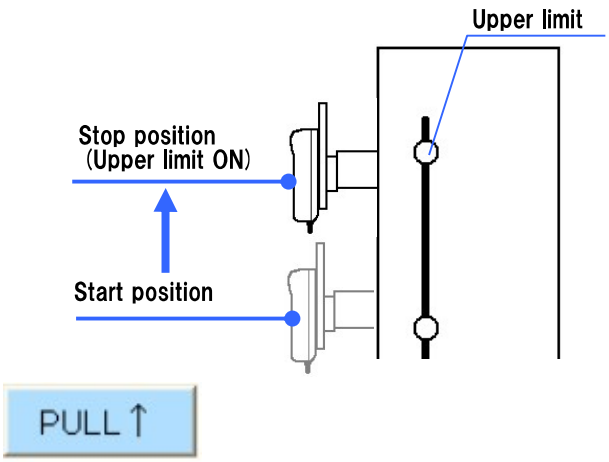
Measurement data is stored from the selected cell position.
Note :If the cell position is selected over an area, the start position is on the upper left cell.

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	8/1/2018 13:54:25
2		
3	Direction	PUSH
4	Test mode	MANU mode
5	Force Gauge	FG*-5
6	Force Unit	N
7	Sampling Rate	10times/sec
8	Trigger(Force)	0
9	Number of data	100
10	+ Maximum	0
11	+ Minimum	0
12	- Maximum	0
13	- Minimum	0
14	Average	0
15		
16	+ Upper limit	0
17	+ Lower limit	0
18	+ Result	Invalid
19	- Upper limit	Invalid
20	- Lower limit	Invalid
21	- Result	Invalid
22		
23	Distance(inch)	Force(N)
24	0	0
25	0	0
26	0	0

Header

Measured data

Graph OFF

	A	B
1	Distance(i	Force(N)
2	0	3.63
3	0	4.08
4	0	4.14
5	0	4.2
6	0	4.44
7	0	4.38
8	0	4.4
9	0.002	4.51
10	0.005	4.45
11	0.01	4.87
12	0.015	4.69
13	0.021	4.67
14	0.028	4.71
15	0.036	4.64
16	0.045	4.85
17	0.054	4.82
18	0.064	4.81

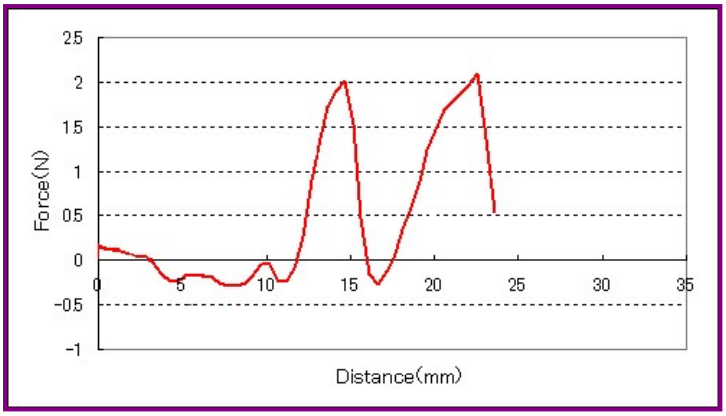
Header

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.

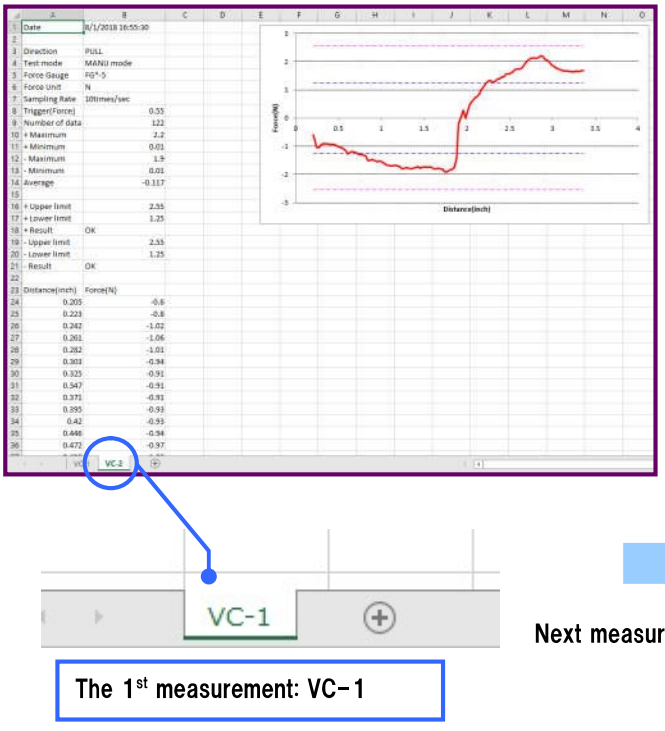


5.6.4. Sheet of each test

Graph ON

One test is assigned one sheet.

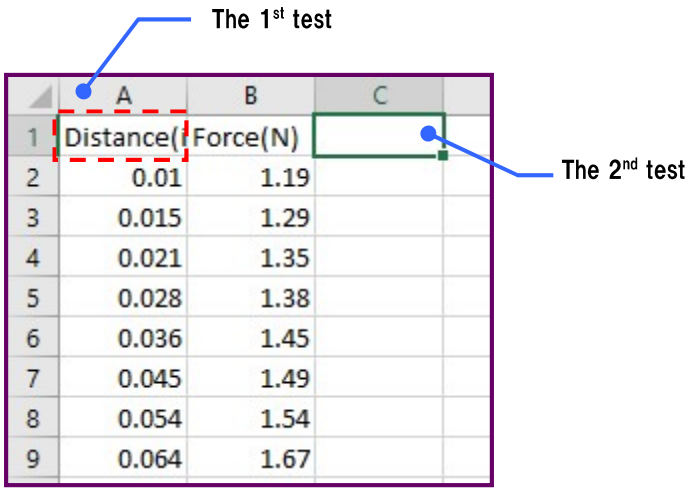
The sheet is named automatically "VC- (sequential number) ".



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



	A	B	C
1	Distance(	Force(N)	
2	0.01	1.19	
3	0.015	1.29	
4	0.021	1.35	
5	0.028	1.38	
6	0.036	1.45	
7	0.045	1.49	
8	0.054	1.54	
9	0.064	1.67	

	IS	IT	IU	IV
1	Distance(i	Force(N)	Distance(i	Force(N)
2	0	2.51	0	-2.51
3	0	2.42	0	-2.47
4	0	2.33	0	-2.47
5	0	2.2	0	-2.49
6	0	2.4	0	-2.47
7	0	2.37	0	-2.53
8	0.001	2.44	0.001	-2.63
9	0.003	2.38	0.003	-2.68
10	0.007	2.53	0.007	-2.58
11	0.011	2.48	0.012	-2.59
12	0.017	2.78	0.017	-2.55
13	0.023	2.93	0.023	-2.53
14	0.03	2.79	0.03	-2.66
15	0.038	2.94	0.037	-2.73
16	0.046	2.76	0.046	-2.74
17	0.055	2.77	0.055	-2.69
18	0.065	2.88	0.065	-2.71
19	0.075	2.95	0.075	-2.66

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

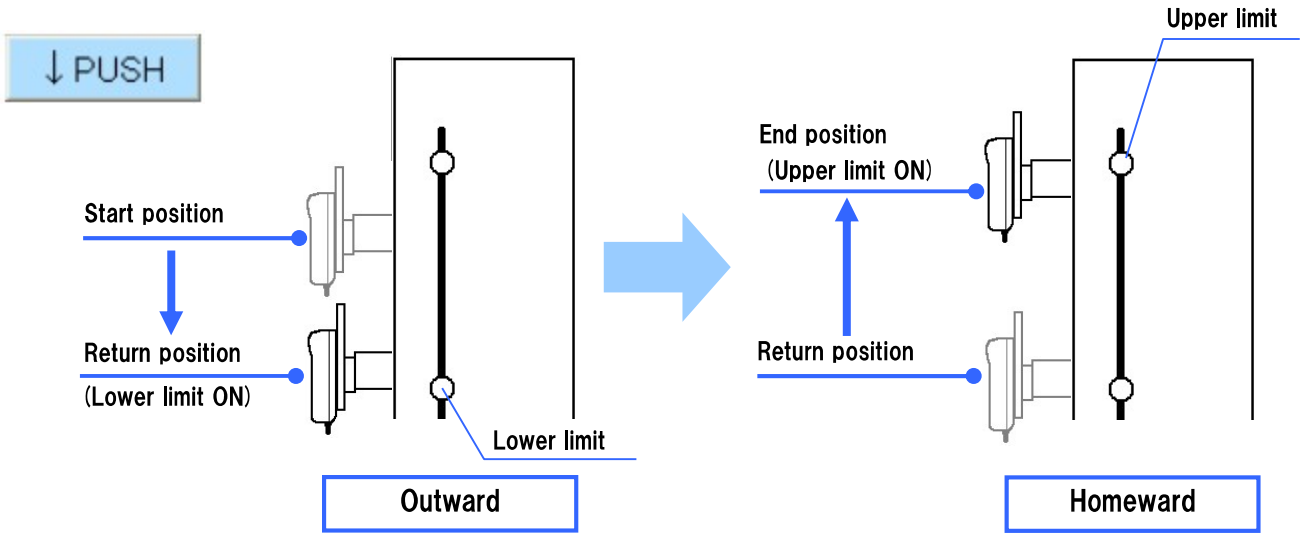
5.7. SING mode

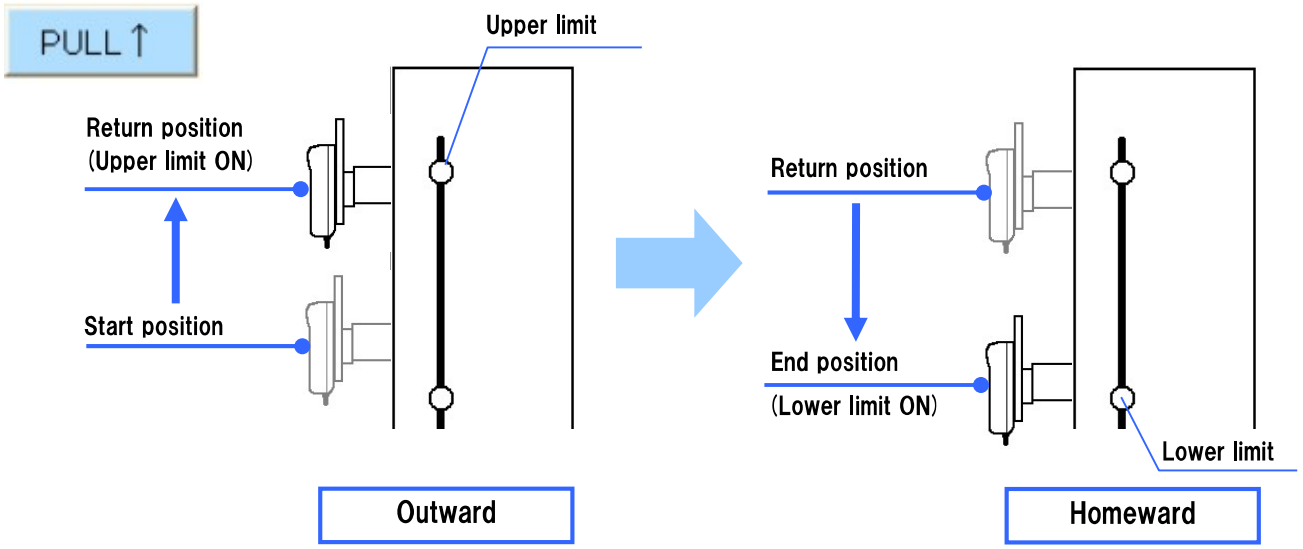
5.7.1. Operation

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.





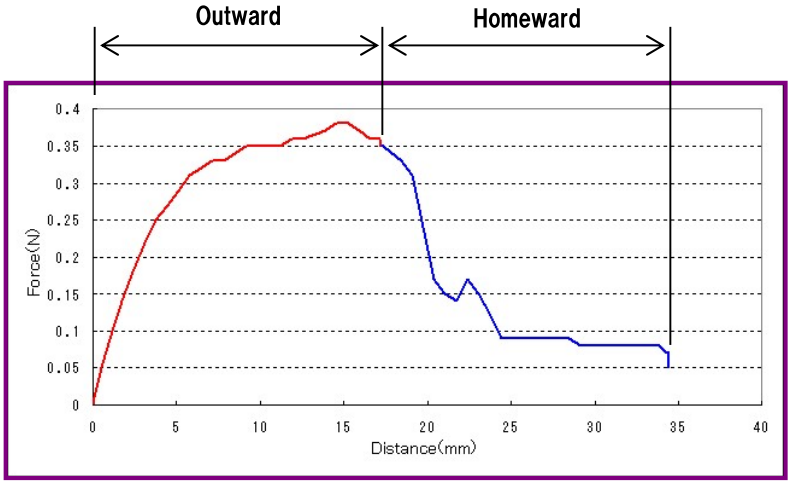
5.7.2. Record of Measurement Data

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

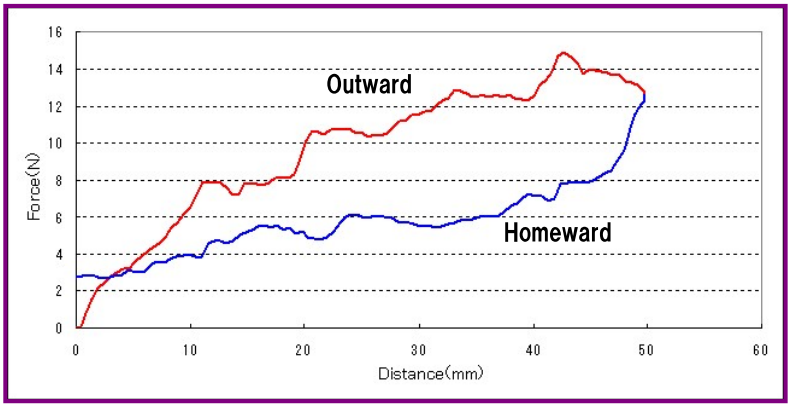
5.7.3. Graph

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



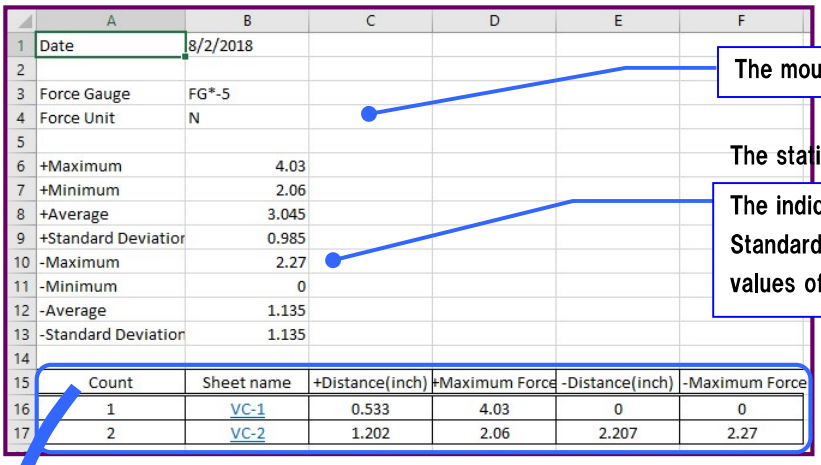
Total Distance check button OFF

5.7.4. Sheet of each test

The recorded 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	E	F
1	Date	8/2/2018				
2						
3	Force Gauge	FG*-5				
4	Force Unit	N				
5						
6	+Maximum	4.03				
7	+Minimum	2.06				
8	+Average	3.045				
9	+Standard Deviatior	0.985				
10	-Maximum	2.27				
11	-Minimum	0				
12	-Average	1.135				
13	-Standard Deviatior	1.135				
14						
15	Count	Sheet name	+Distance(inch)	+Maximum Force	-Distance(inch)	-Maximum Force
16	1	VC-1	0.533	4.03	0	0
17	2	VC-2	1.202	2.06	2.207	2.27

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.

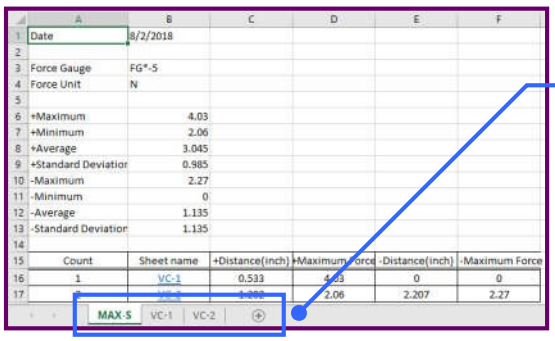
The maximum force value and the distance at that time

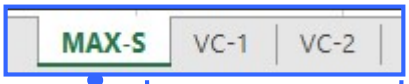
Maximum force value of each test

Test No.	Sheet	Distance (mm)	Maximum Value
1	VC-1	0.533	4.03
2	VC-2	1.202	2.06

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 blue hyperlink.

The number of consecutive tests.





Each measurement sheet of SING mode.

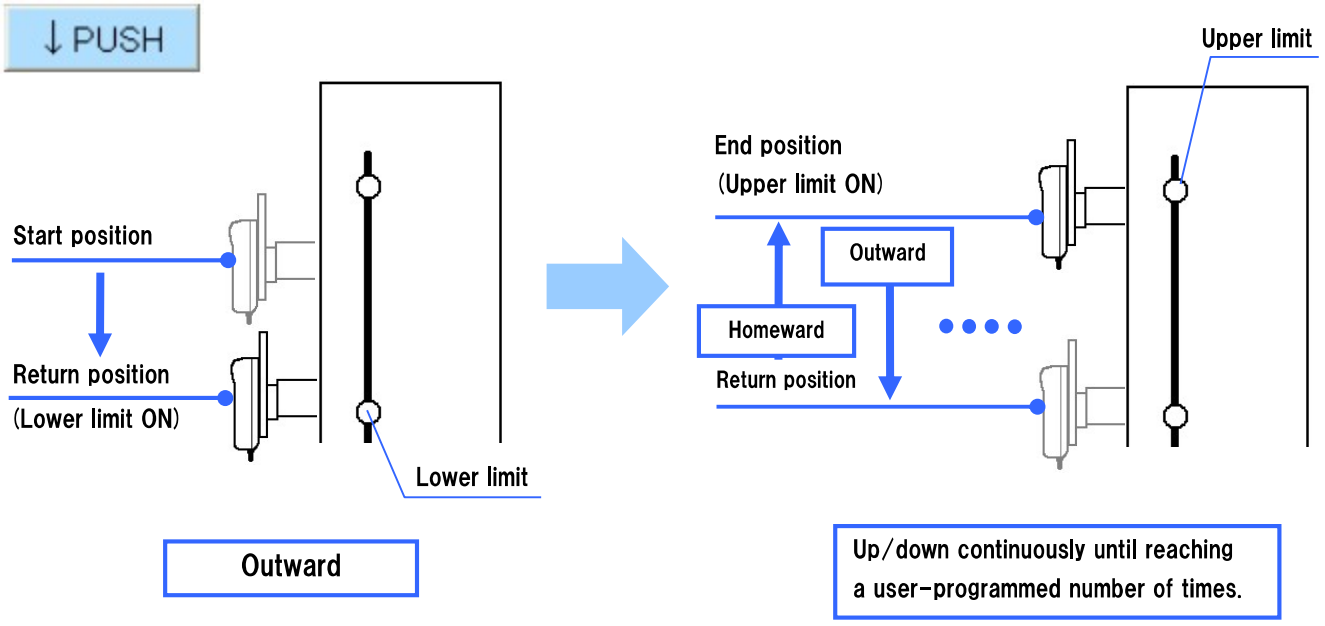
The "MAX-S" sheet is made at the head of the measurement sheets in SING mode.

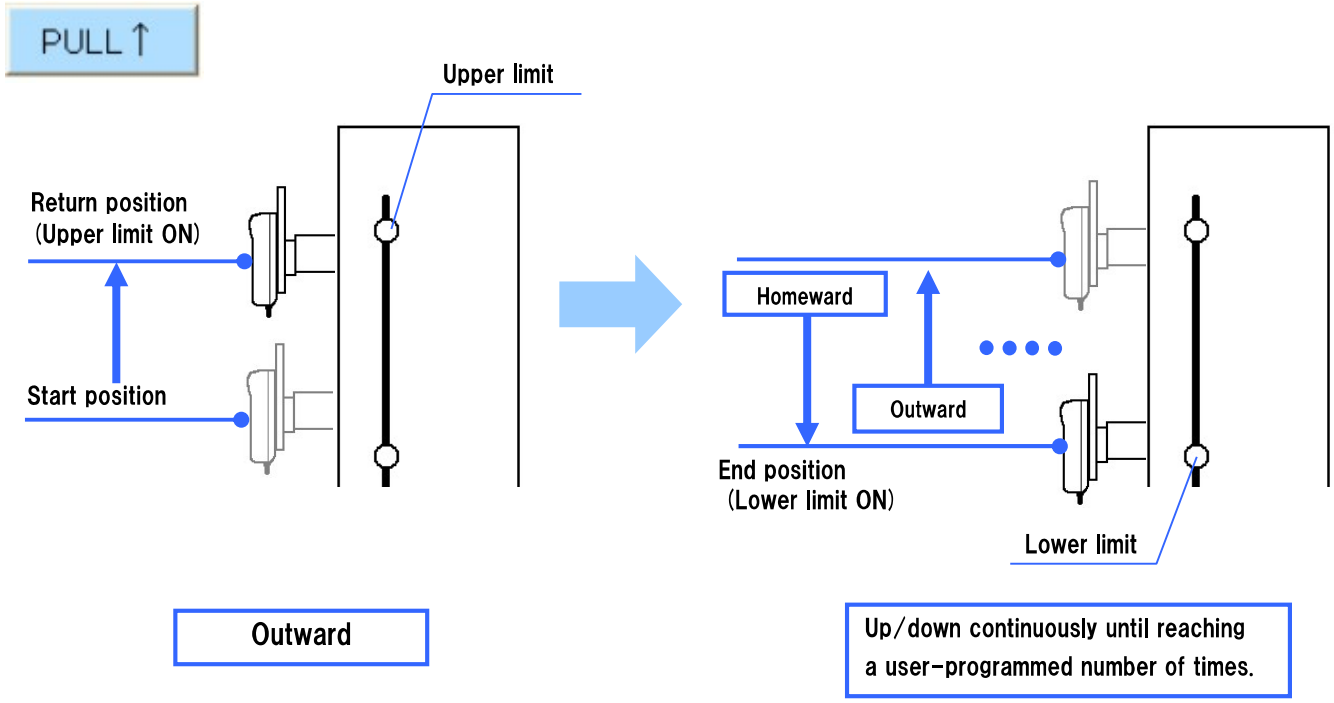
5.8. CONT mode

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	8/2/2018 15:39:54
2		
3	Direction	PUSH
4	Test mode	CONT mode
5	Force Gauge	FG*-5
6	Force Unit	N
7	Sampling Rate	10times/sec
8	Repeat Count	1
9	Sampling Numb	1
10	Trigger(Force)	0
11	Number of data	99
12	+ Maximum	1.23
13	+ Minimum	0.59
14	- Maximum	NO DATA
15	- Minimum	NO DATA
16	Average	1.064
17		
18	+ Upper limit	0
19	+ Lower limit	0
20	+ Result	Invalid
21	- Upper limit	Invalid
22	- Lower limit	Invalid
23	- Result	Invalid
24		
25	Count	1
26	MAX Sheet	MAX-1
27		
28	Distance(inch)	Force(N)
29	0	0.59
30	0	0.75
31	0	0.96
32	0	1.03

Header

Measurement data

Graph OFF

	A	B	C
1	Distance(i	Force(N)	
2	0	1.91	
3	0	1.92	
4	0	1.92	
5	0	1.91	
6	0	1.91	
7	0	1.92	
8	0	1.92	
9	0.003	1.92	
10	0.006	1.92	
11	0.01	1.92	
12	0.016	1.91	
13	0.022	1.92	
14	0.029	1.91	
15	0.037	1.92	

Header

Measurement data

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

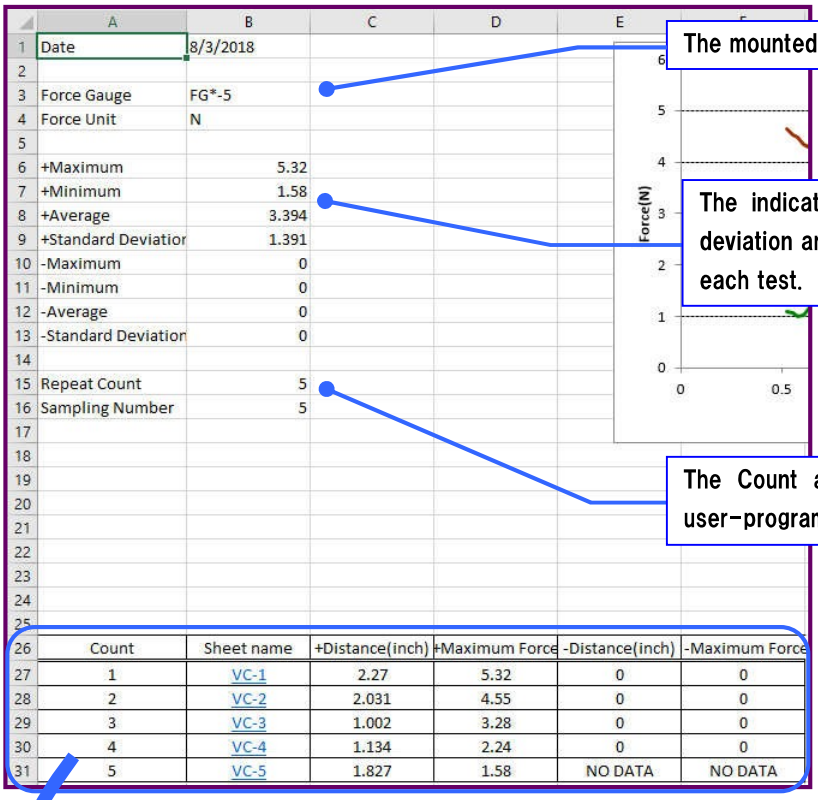
When the test is continuously done, the maximum value at each test is recorded in the MAX sheet line by line.
The MAX sheet and respective data sheets have hyperlinks allowing quick linkage back and forth between their corresponding linked data.
Refer to the following clause for a detailed content.

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	E
1	Date	8/3/2018			
2					
3	Force Gauge	FG*-5			
4	Force Unit	N			
5					
6	+Maximum	5.32			
7	+Minimum	1.58			
8	+Average	3.394			
9	+Standard Deviatior	1.391			
10	-Maximum	0			
11	-Minimum	0			
12	-Average	0			
13	-Standard Deviatior	0			
14					
15	Repeat Count	5			
16	Sampling Number	5			
17					
18					
19					
20					
21					
22					
23					
24					
25					

26	Count	Sheet name	+Distance(inch)	+Maximum Force	-Distance(inch)	-Maximum Force
27	1	VC-1	2.27	5.32	0	0
28	2	VC-2	2.031	4.55	0	0
29	3	VC-3	1.002	3.28	0	0
30	4	VC-4	1.134	2.24	0	0
31	5	VC-5	1.827	1.58	NO DATA	NO DATA

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

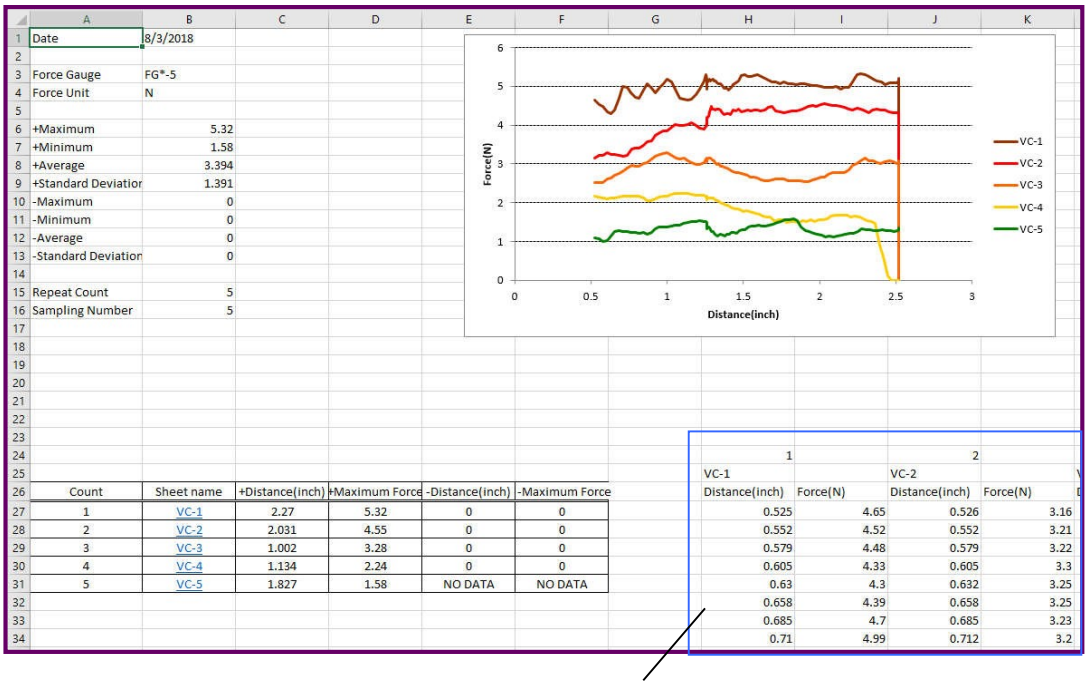
Test No.	Sheet	Distance (mm)	Maximum Value
1	VC-1	2.27	5.32
2	VC-2	2.031	4.55
3	VC-3	1.002	3.28
4	VC-4	1.134	2.24
5	VC-5	1.827	1.58

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 tests.

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).

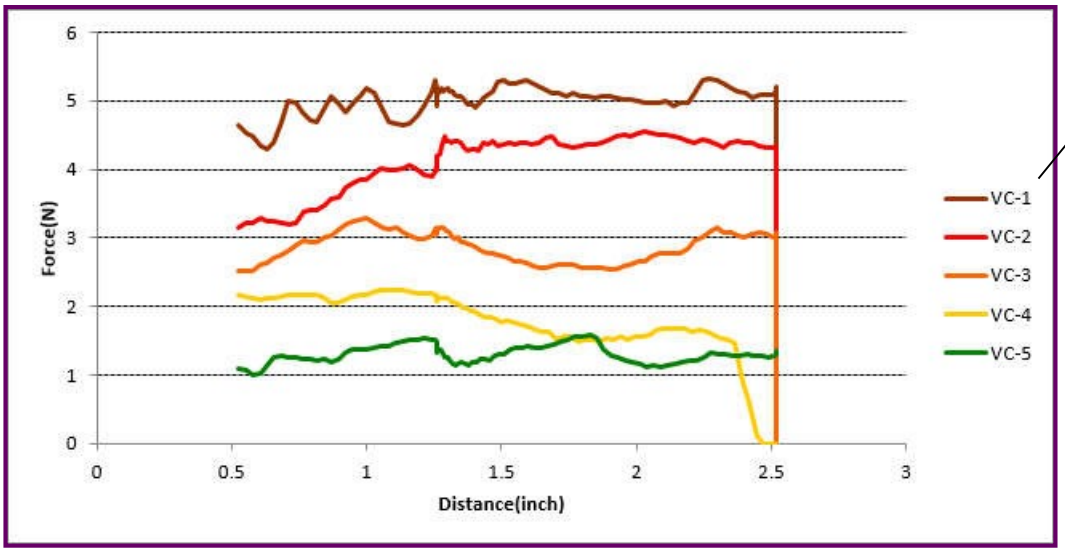


	A	B	C	D	E	F	G	H	I	J	K
1	Date	8/3/2018									
2											
3	Force Gauge	FG*-5									
4	Force Unit	N									
5											
6	+Maximum	5.32									
7	+Minimum	1.58									
8	+Average	3.394									
9	+Standard Deviatior	1.391									
10	-Maximum	0									
11	-Minimum	0									
12	-Average	0									
13	-Standard Deviatior	0									
14											
15	Repeat Count	5									
16	Sampling Number	5									
17											
18											
19											
20											
21											
22											
23											
24											
25											
26	Count	Sheet name	+Distance(inch)	+Maximum Force	-Distance(inch)	-Maximum Force					
27	1	VC-1	2.27	5.32	0	0					
28	2	VC-2	2.031	4.55	0	0					
29	3	VC-3	1.002	3.28	0	0					
30	4	VC-4	1.134	2.24	0	0					
31	5	VC-5	1.827	1.58	NO DATA	NO DATA					
32											
33											
34											

	1		2	
	VC-1		VC-2	
	Distance(inch)	Force(N)	Distance(inch)	Force(N)
	0.525	4.65	0.526	3.16
	0.552	4.52	0.552	3.21
	0.579	4.48	0.579	3.22
	0.605	4.33	0.605	3.3
	0.63	4.3	0.632	3.25
	0.658	4.39	0.658	3.25
	0.685	4.7	0.685	3.23
	0.71	4.99	0.712	3.2

Measurement data for the overwritten graph.

Ten measurement data from the first measurement is overwritten.



Explanation

5.8.5. Sheet of each test

It is similar to 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.

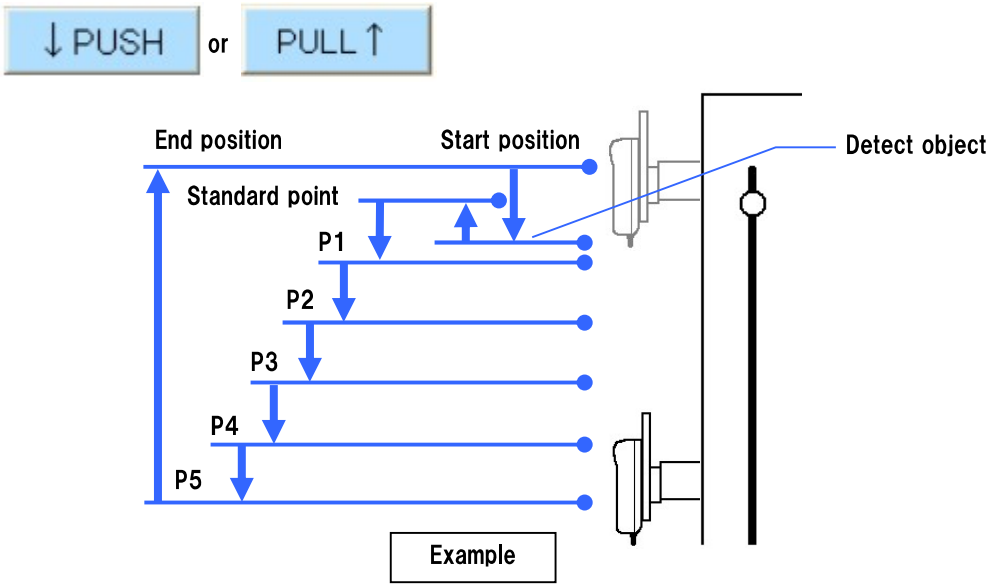
5.9. PROG mode

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 must set the parameter with the 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

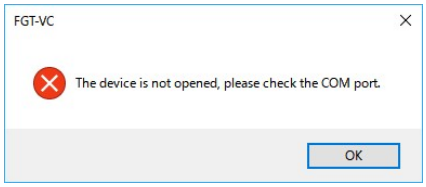
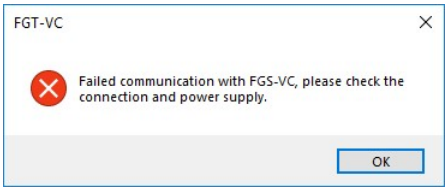
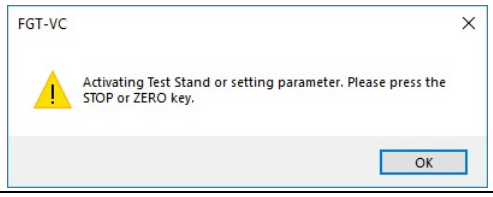
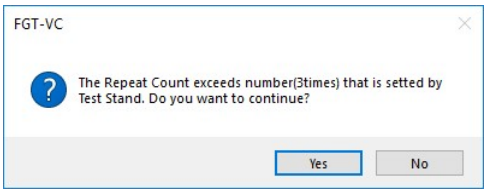
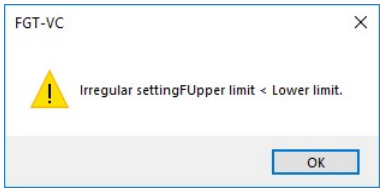
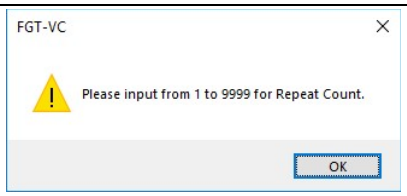
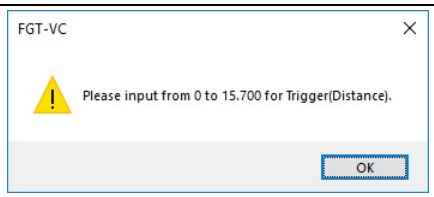
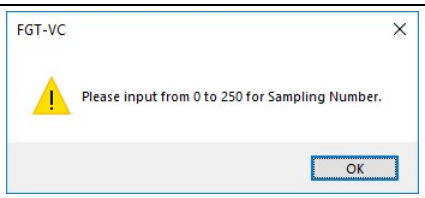
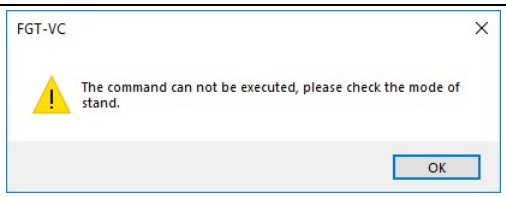
It is similar to MANU mode, refer to 5.6.4. Sheet of each test. However, the MAX sheet is newly made at each completing repeat count.

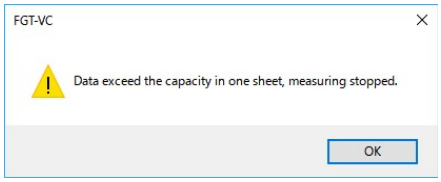
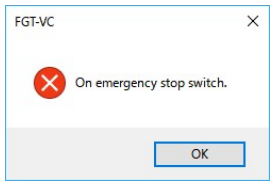
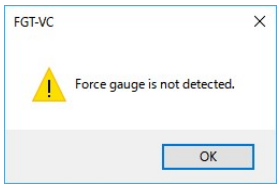
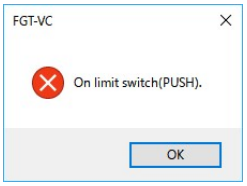
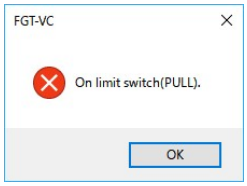
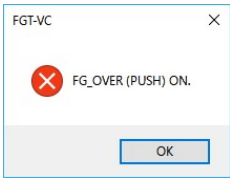
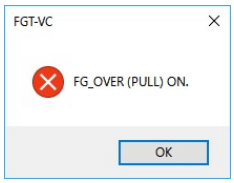
6. Input Range

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

	The device is not opened. Please check the COM port. Refer to 4.4. Confirmation of COM Port.
	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.
	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.
	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.
	The Upper limit is smaller than the Lower limit. The Upper limit should be equal or larger than the Lower limit.
	Exceeding the input range of the Repeat Count. The range is from 1 to 9999.
	The Trigger is wrong. The setting value of trigger distance should be from 1 to 15.70.
	When the Graph is ON, the Sampling Number should be from 0 to 250.
	The stand can not be operated. Please confirm the operation mode of the stand. The mode should be MANU, SING, CONT or PROG mode.

	The number of measuring data points that can be recorded on the sheet is exceeded. Please make a new Book file or sheet.
	The emergency switch of the stand is turned on. Please conform a safe condition exists. Then please turn the emergency switch off.
	Please check the force gauge’ s power is on. Please confirm the connection with the stand and the force gauge is properly connected.
	The overload of PULL direction has occurred. Please move to PUSH direction to release the overload.
	The overload of PUSH direction has occurred. Please move to PULL direction to release the overload.
	The PULL limit switch is on. Please move to PUSH direction, or adjust the position of the PULL limit switch.
	The PUSH limit switch is on. Please move to PULL direction, or adjust the position of the PULL limit switch.