FORCE MEASUREMENT
IMADA

Additional chargeable functions*1,2 for Force Recorder Next Series

Plug-in designed to enhance

the quality of professional measurement and analysis

- **Friction Testing Module**
- **Peel Testing Module 1**
- **Pressure/Stretchability Measurement Module**
- **Switch Operating Force Testing Module**
- **Spring Rate Measurement Module**
- **Deflection Correction Function**
- **Bending Stress Measurement Module**
- **Excel Data Writing Function**

*Please refer to the specifications for details concerning the Force Recorder Next series.
*1 IMADA Connected introduces other supplementary functions (or features) for the Force Recorder Next series.
For the latest lineup, please visit IMADA Connected.
*2 For the additional Force Recorder Next Series supplementary functions downloads listed below, the purchase of the download card(s) required.
Force Recorder Next series updates may be required for installing

COF

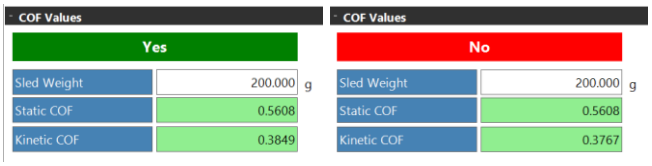
Friction Testing Module

Automatically calculates Coefficient of Friction from measured values and supports compliance with relevant standards for friction tests

Feature 1

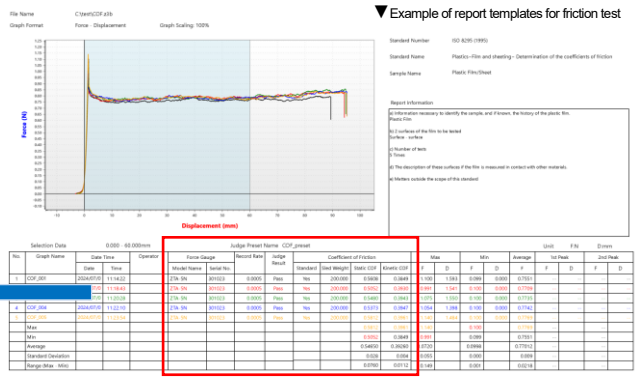
Automatic calculation of friction coefficient, standard conformity judgment of file/selected data, pass/fail judgment of measurement results

Automatically calculates and displays the coefficient of static friction and average dynamic friction coefficient from measurement results by presetting the weight of the weights and the calculation section. It also displays the result of standard conformity judgment of selected data.



■ Measurement data can be easily output using dedicated report templates, csv, etc.

▼Example of report templates for friction test



Judge Preset Name COF_preset

Force Gauge		Record Rate	Judge Result	Coefficient of Friction			
Model Name	Serial No.			Standard	Sled Weight	Static COF	Kinetic COF
ZTA-5N	301023	0.0005	Pass	Yes	200.000	0.5608	0.3849
ZTA-5N	301023	0.0005	Pass	Yes	200.000	0.5052	0.3930
ZTA-5N	301023	0.0005	Pass	Yes	200.000	0.5480	0.3943
ZTA-5N	301023	0.0005	Pass	Yes	200.000	0.5373	0.3947
ZTA-5N	301023	0.0005	Pass	Yes	200.000	0.5812	0.3961
						0.5812	0.3961
						0.5052	0.3849
						0.54650	0.39260
						0.028	0.004
						0.0760	0.0112

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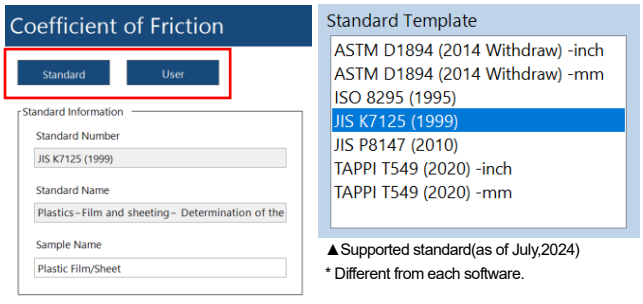
Feature 2

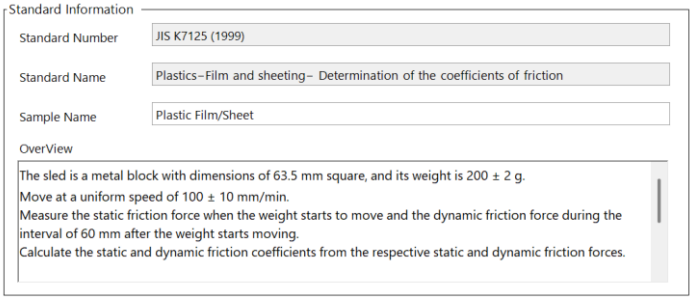
Supported measurements complying with friction test-related standards

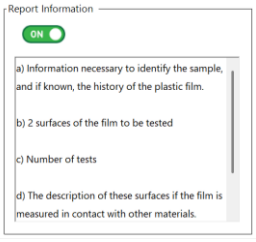
■ Measurement conditions comply with JIS, and other standards related to friction testing are preinstalled for the efficiency in setting up according to the standards. In addition, the user preset function can save any user-made measurement conditions.



▲Supported standard(as of July,2024)
* Different from each software.

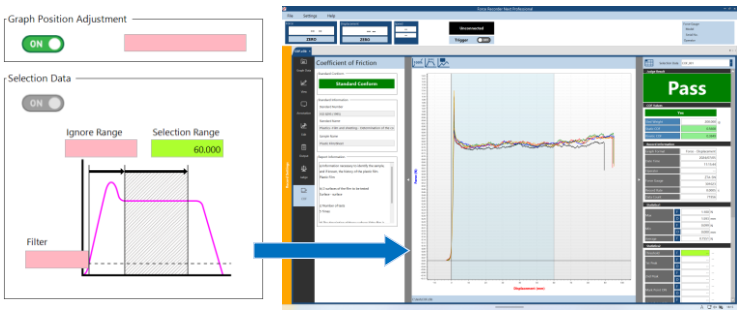
■ Supports measurement setup with the standard with descriptions





■ Easy report creation thanks to preinstalled report setting required for relevant standards

■ The Select data required for kinetic friction calculation set automatically, according to the standards.



■ In addition to the result of standard conformity judgment of selected data, it also displays the result of standard conformity judgment of file.

Peel

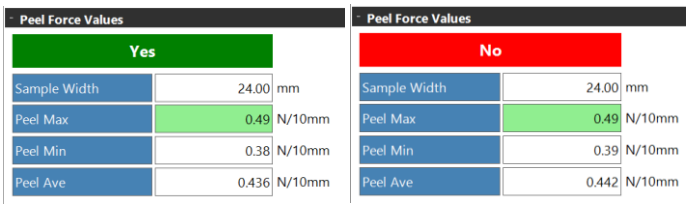
Peel Testing Module 1

Automatic conversion of measurement results to peel force units and the measurement standards compliance support

Feature 1

Automatic conversion of peel force units, standard conformity judgment of file/selected data, pass/fail judgments of measurement results

The measurement results are automatically converted and displayed in the set peel force unit (N/10mm, etc.) by advanced setting conditions such as sample width, conversion unit, and calculation interval. It also displays the result of standard conformity judgment of selected data.



■ Measurement data can be easily output using dedicated report templates, csv, etc.

▼Example of report templates for peel test

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Judge Preset Name Peel

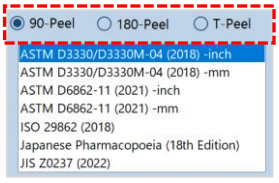
▼Output of Peel test measurement data

Force Gauge		Record Rate	Judge Result	Peel (N/10mm)				
Model Name	Serial No.			Standard	Sample Width	Peel Max	Peel Min	Peel Ave
ZTA-50N	311298	0.0005	Pass	No	24.00	0.49	0.39	0.442
ZTA-50N	311298	0.0005	Pass	No	24.00	0.48	0.38	0.433
ZTA-50N	311298	0.0005	Pass	No	24.00	0.45	0.36	0.402
						0.49	0.39	0.442
						0.45	0.36	0.402
						0.473	0.377	0.426
						0.021	0.015	0.021
						0.04	0.03	0.04

Feature 2

Supports peel test compliance with relevant standards

■ Same as in the Friction Testing Module, possible to additionally preset and register the various measurement conditions.



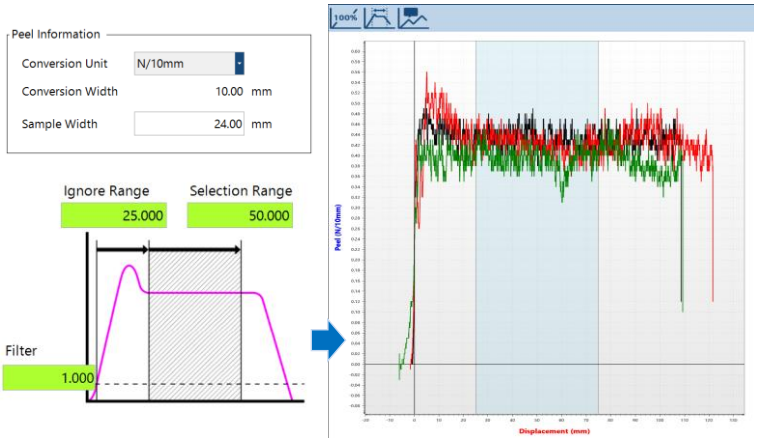
◂Packaging industry standards for the three test methods with 90/180 degrees, and the T-shape tests are preset and registered as measurement conditions.

▼Supported standard(as of November2024)

Peel test supported standards	90°	180°	T-Peel
ASTM D3330/D3330M-04 (2018)	✓	✓	–
ASTM D6862-11 (2021)	✓	–	–
ISO 29862 (2018)	✓	✓	–
Japanese Pharmacopoeia (18th Edition)	✓	✓	–
JIS Z0237 (2022)	✓	✓	–
ASTM F88/F88M-23 (2023)	–	✓	✓
ASTM D1876-08 (2023)	–	–	✓
ISO 11339 (2022)	–	–	✓
JIS K6854-3 (1999)	–	–	✓
JIS Z0238 (1998)	–	–	✓
JIS Z1707 (2019)	–	–	✓
BS EN 868-5:2018	–	–	✓

* Different from each software.

■ The peel test version of the Friction Testing Module and the corresponding standards and measurement conditions are for peel tests. The section data required to calculate the average peel force in the specified peel range is also automatically set.



■ In addition to the result of standard conformity judgment of selected data, it also displays the result of standard conformity judgment of file.

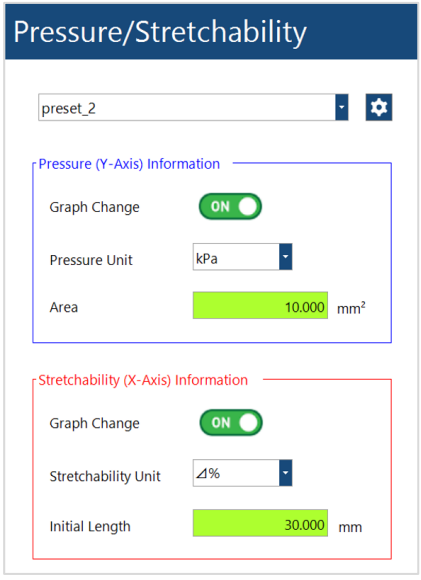
Pressure/Stretchability Measurement Module

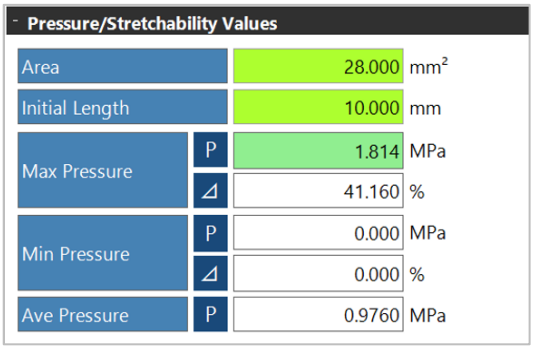
Displays Compression/Tensile measurement results in terms of Pressure and Stretchability

Feature 1

Automatic conversion of force value per area unit and stretchability / stretchability rate, and pass/fail judgment of measurement results

■ When a compression/tension test performed by setting the sample's cross-sectional area and the compression jig's area, the force value of the measurement results converted to a force value per unit area (= pressure) and displayed, in addition, the initial length/height of the sample set, and after compression/tension measurement, the stretchability/stretchability rate displayed from the displacement amount. The graph's Y-axis (pressure ⇔ force) and X-axis (stretchability ⇔ displacement) can also be switched.



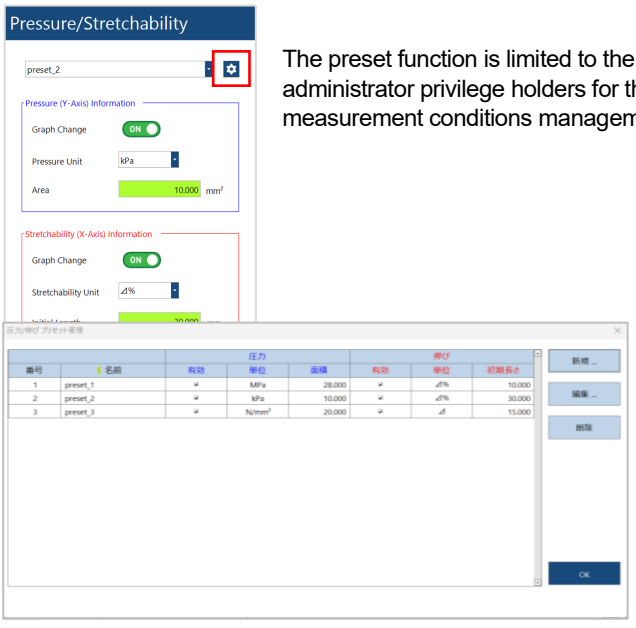


*Units for Pressure and Stretchability unable to change after recording.
*Parameters such as Young's modulus and yield point are made to order. Please contact us for details.
*Stretchability/stretchability rate conversion only supported by Force Recorder Next Professional.

Feature 2

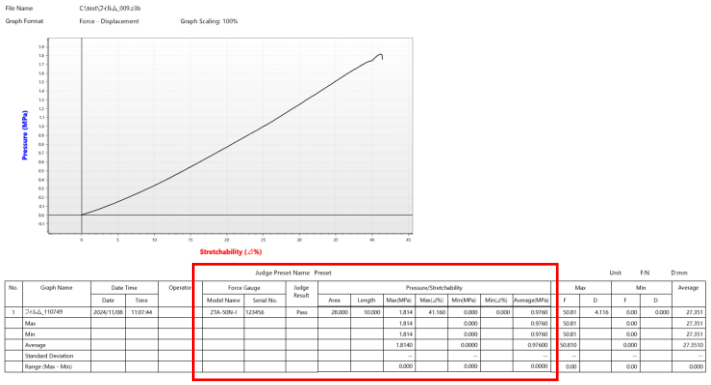
Measurement efficiency supported with measurement condition presets

■ Measurement conditions preset before starting measurement, making switching between conditions to suit the sample easier and improving measurement efficiency.



The preset function is limited to the administrator privilege holders for the measurement conditions management.

■ Measurement data can be easily output using dedicated report templates, csv, etc.



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Judge Preset Name Preset

▼Output of Pressure/Stretchability measurement data

Force Gauge		Judge Result	Pressure/Stretchability						
Model Name	Serial No.		Area	Length	Max(MPa)	Max(⊿%)	Min(MPa)	Min(⊿%)	Average(MPa)
ZTA-50N-I	123456	Pass	28.000	10.000	1.814	41.160	0.000	0.000	0.9760
					1.814		0.000		0.9760
					1.814		0.000		0.9760
					1.8140		0.0000		0.97600
					--		--		--
					0.000		0.000		0.0000

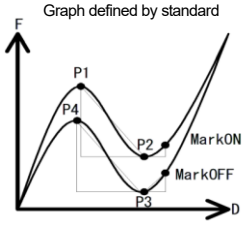
Switch Operating Force Testing Module

Supports standard compliance for calculating and measuring the tactile characteristics

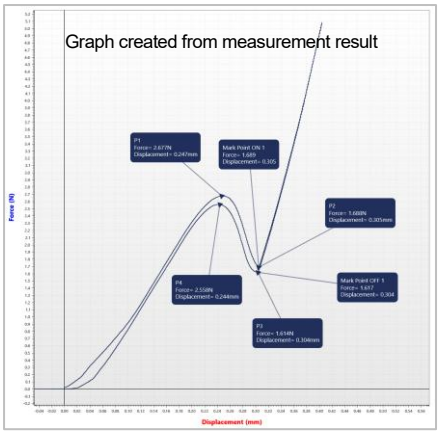
Feature 1

Automatic calculation of Switch Operating Force Testing Module, standard compliance/conformity, pass/fail judgment of measurement results

Graph defined by standard



■ Switch characteristic parameters such as click rates automatically calculated and displayed from the switch actuation and bottom reaction force. The Selected standard compliance is displayed.



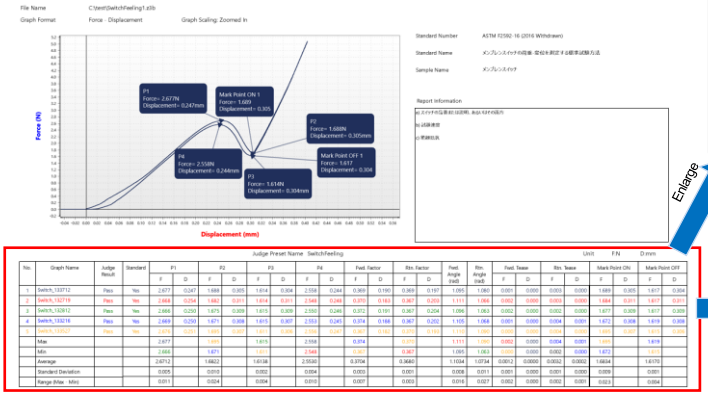
*Force-displacement graphs are only supported by Force Recorder Next Professional.

Switch Operating Force Values

		Yes	
Threshold	F	0.100	
P1	F	2.677	N
	D	0.247	mm
P2	F	1.688	N
	D	0.305	mm
P3	F	1.614	N
	D	0.304	mm
P4	F	2.558	N
	D	0.244	mm
Fwd. Factor	F	0.369	
	D	0.190	
Rtn. Factor	F	0.369	
	D	0.197	
Fwd. Angle		1.095	rad
Rtn. Angle		1.080	rad
Fwd. Tease	F	0.001	N
	D	0.000	mm
Rtn. Tease	F	0.003	N
	D	0.000	mm

■ Measurement data can be easily output using dedicated report templates, csv, etc.

▼Example of report template for Switch Operating Force Testing Module



Judge Preset Name SwitchFeeling

No.	Graph Name	Judge Result	Standard	P1		P2		P3		P4	
				F	D	F	D	F	D	F	D
1	Switch_133712	Pass	Yes	2.677	0.247	1.688	0.305	1.614	0.304	2.558	0.244
2	Switch_132719	Pass	Yes	2.668	0.254	1.682	0.311	1.614	0.311	2.548	0.248
3	Switch_132812	Pass	Yes	2.666	0.250	1.675	0.309	1.615	0.309	2.550	0.246
4	Switch_133216	Pass	Yes	2.669	0.250	1.671	0.308	1.615	0.307	2.553	0.245
5	Switch_133527	Pass	Yes	2.676	0.251	1.695	0.307	1.611	0.306	2.556	0.247
	Max			2.677		1.695		1.615		2.558	
	Min			2.666		1.671		1.611		2.548	
	Average			2.6712		1.6822		1.6138		2.5530	
	Standard Deviation			0.005		0.010		0.002		0.004	
	Range (Max - Min)			0.011		0.024		0.004		0.010	

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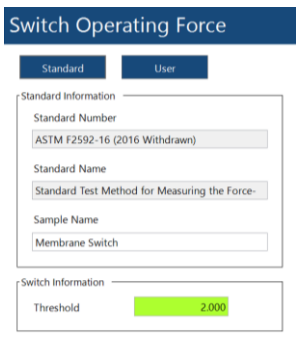
Unit F:N D:mm

Fwd. Factor		Rtn. Factor		Fwd. Angle (rad)	Rtn. Angle (rad)	Fwd. Tease		Rtn. Tease		Mark Point ON		Mark Point OFF	
F	D	F	D			F	D	F	D	F	D	F	D
0.369	0.190	0.369	0.197	1.095	1.080	0.001	0.000	0.003	0.000	1.689	0.305	1.617	0.304
0.370	0.183	0.367	0.203	1.111	1.066	0.002	0.000	0.003	0.000	1.684	0.311	1.617	0.311
0.372	0.191	0.367	0.204	1.096	1.063	0.002	0.000	0.002	0.000	1.677	0.309	1.617	0.309
0.374	0.188	0.367	0.202	1.105	1.068	0.001	0.000	0.004	0.001	1.672	0.308	1.619	0.308
0.367	0.182	0.370	0.193	1.110	1.090	0.000	0.000	0.004	0.000	1.695	0.307	1.615	0.306
0.374		0.370		1.111	1.090	0.002	0.000	0.004	0.001	1.695		1.619	
0.367		0.367		1.095	1.063	0.000	0.000	0.002	0.000	1.672		1.615	
0.3704		0.3680		1.1034	1.0734	0.0012	0.0000	0.0032	0.0002	1.6834		1.6170	
0.003		0.001		0.008	0.011	0.001	0.000	0.001	0.000	0.009		0.001	
0.007		0.003		0.016	0.027	0.002	0.000	0.002	0.001	0.023		0.004	

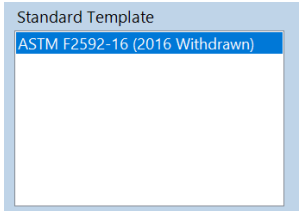
Feature 2

Supports measurements complying with the Switch Operating Force Testing Module

■ The preset measurement conditions comply with relevant standards for switch testing for easy setups according to the standard required. Also, the user preset function enables additional standard registration for the measurement requirements.

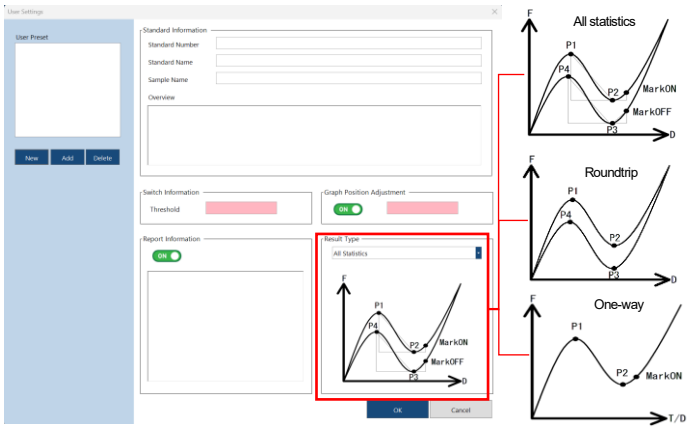


▼Supported standard(as of November2024)



*Additional specifications added by special order. Please contact us for details.

■ For User Presets, 3 "Result Types" are available for the measurement requirements.



Spring

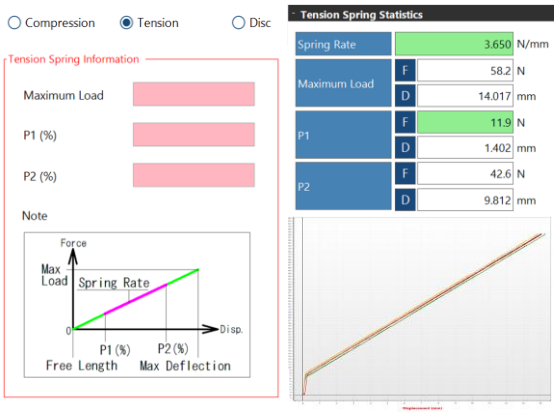
Spring Rate Measurement Module

Automatic calculation of spring rate for compression springs, extension springs, and disc springs

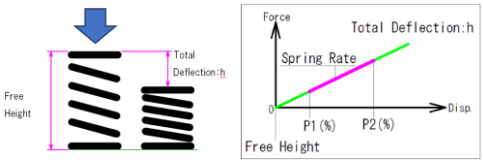
Feature Automatic calculation of “spring rate”, pass/fail judgments of measurement results

*This function is only supported by Force Recorder Next Professional.

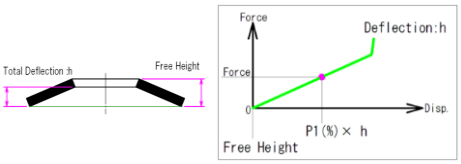
■ Automatically calculate the “spring rate” which is the force required to extend or compress a spring and display the measurement result.
In addition, measurement data with spring rate and related parameters can be easily output using dedicated report templates, csv, etc.



▲Tension Spring Selection
Calculate Spring Rate between P1(%) and P2(%) of the displacement of the maximum force (total deflection) applied to the spring.



▲Compression Spring Selection
Calculate Spring Rate between P1(%) and P2(%) up to total reflection



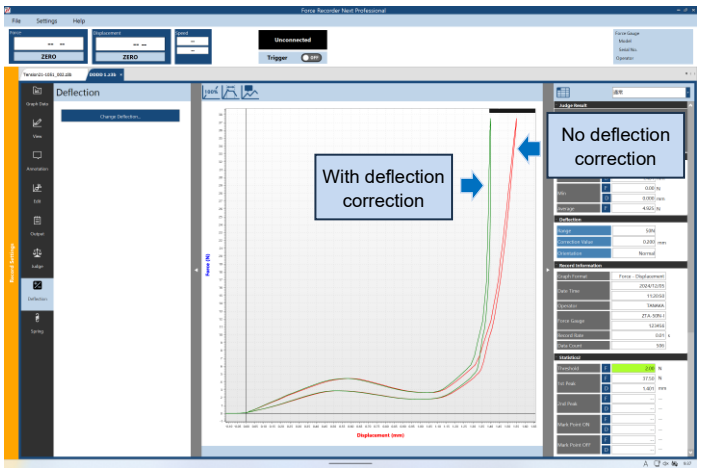
▲Disc Spring Selection
Calculate force at a specified percentage P1(%) of total deflection
*Must be used in combination with Deflection Correction Function.

Deflection

Deflection Correction Function

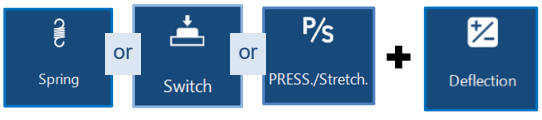
Deflection correction of measurement devices to obtain high accuracy force-displacement measurement

Feature Correct deflection of measurement devices and reflect highly accurate displacement values in measurement results

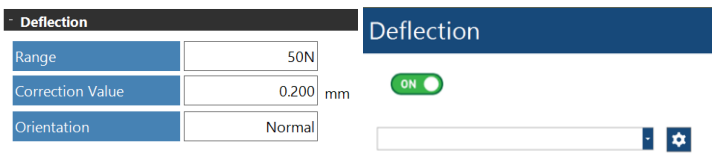


*This function is only supported by Force Recorder Next Professional.

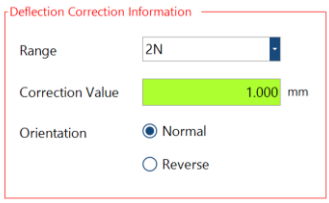
■ Able to be used in combination with other additional chargeable functions.



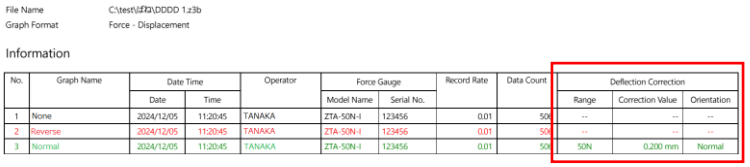
■ Correct error caused by deflection of measurement devices by software and reflect highly accurate displacement values in the measurement results. In particular, the relationship between force and displacement can be measured more precisely in tests with large force - small displacement values.



■ Able to register the preset of Deflection Correction Information. The deflection correction information is displayed in the Statistics tab on the right of viewing window.



■ Deflection Correction Information can be output along with each output data.



Bending Stress Measurement Module

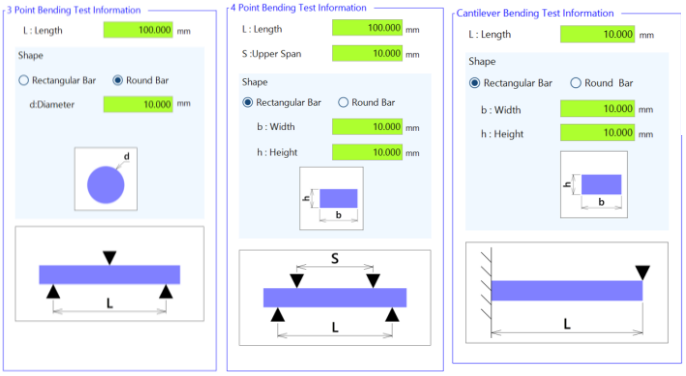
Automatically calculates bending stress for 3-point bending, 4-point bending, and cantilever beam tests.

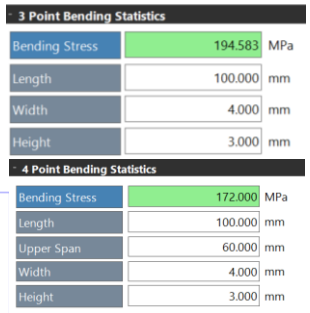
Feature Automatically calculate and display “bending stress” for material strength design, performance evaluation, and durability confirmation / judge pass or fail based on measurement results.

■ Specify the necessary parameters according to each test method, automatically calculate the “bending stress”, and display the measurement results. Dedicated report templates and CSV formats are available to output bending stress and related parameters.

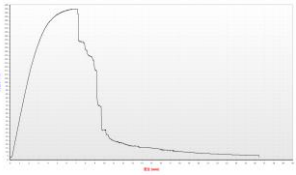
◀ Applicable to three types of test methods.

■ For each test method, the parameters required to calculate 'bending stress' include the distance between supports, sample shape (*1), and size etc.





■ The graph units can be converted from load (N) to bending stress (MPa).



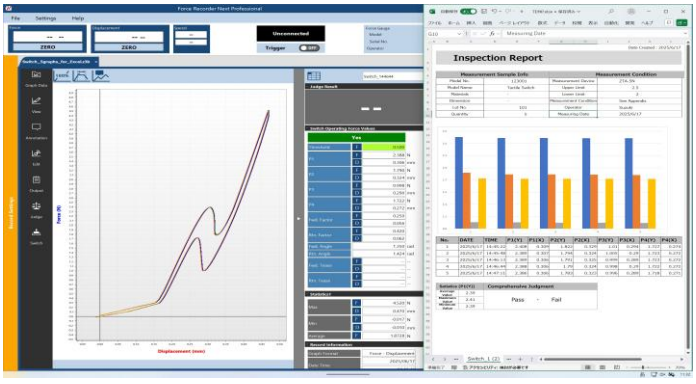
* Applicable only bending tests with a single-point concentrated force.

*1 Applicable only for square/rectangular bar and round bar samples. Not applicable for hollow bars.

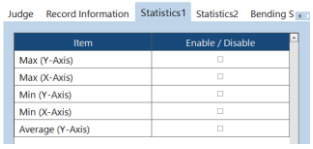
Excel Data Writing Function

Automatically write measurement data to any specified Excel file.

Feature Automatically writing measurement data to an Excel file supports the creation of measurement result reports.



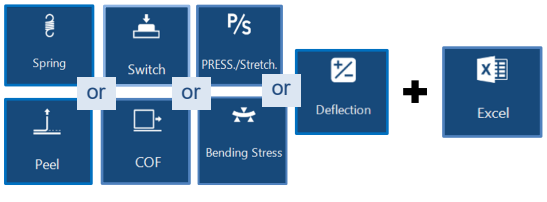
■ Statistical values, record information, pass/fail judgment results, and other parameters are automatically written to the Excel file specified by the user.



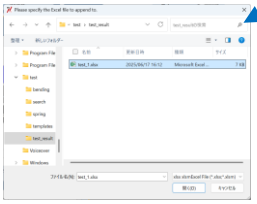
◀ Able to predefine the parameters to be written to the Excel file.

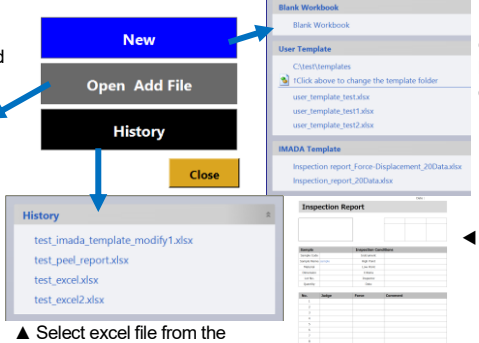
■ The Excel file to be written to can be specified using one of three buttons in the pre-record settings tab: [New], [Open Add File], or [History].

■ Able to be used in combination with other additional chargeable functions.



▼Select the excel file to append the measurement data.





◀ Create the excel file from blank workbook or templates.

◀ Template sample

▲ Select excel file from the previously used file list.

*Supported excel file formats: [.xlsx] and [.xlsm].

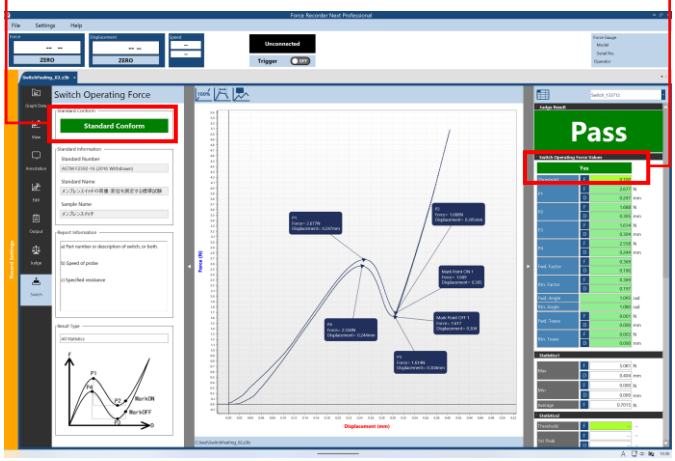
Standard Conformity Judgment

* This function is not available in additional chargeable function without [Standard Settings].

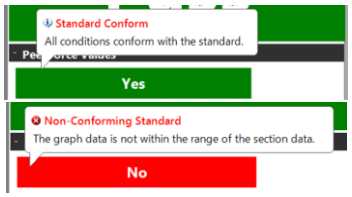
The [Standard Conformity Judgment] is available in additional chargeable functions with [Standard Setting]. Each judgment result can be confirmed in the measurement results viewing window. The [Conformity Judgment of File] is displayed on the left side, and the [Conformity Judgment of Selected Data] is displayed on the right side.

Conformity Judgment of File

- The software evaluates whether the entire file data has been acquired according to the software's configurable conditions for standards.
- The reasons for "Conform / Non-Conform" are displayed in the popup window over the judgment result.
- The [Conformity Judgment of File] and [Conformity Judgment of Selected Data] will not be conducted in the measurement result acquired by using user preset conditions. The judgment result will be displayed as [--].



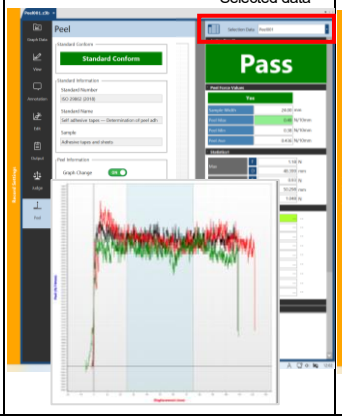
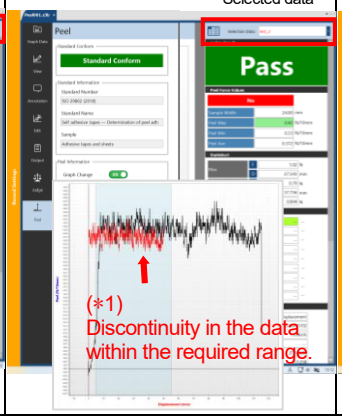
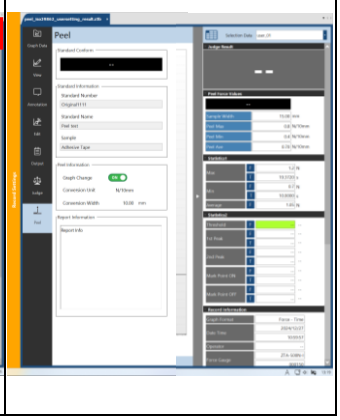
Conformity Judgment of Selected Data



- The software evaluates whether the individual measurement data in the file meet the selected standards.
- The reasons for "Yes / No" are displayed in the popup window over the judgment result.
- The reason of judgment result "No" varies depending on the additional chargeable function. Please refer to the instruction manual for each function.

[Conformity Judgement Pattern]

*An example of applying the ISO 29862(2018) preset in the Peeling Test Module.

	Pattern1		Pattern2		Pattern3		Pattern4	
Compliance Conditions	1. Force Unit:N 2. Displacement Unit:mm 3. Conversion Unit:N/10mm 4. Graph Format:Force-Displacement 5. Selection Data Range:50mm 6. Sample Width:≦24±0.5m							
Judgment Result	Standard Conform	Yes	Standard Conform	No	Standard Non-Conform	No	--	--
Description of Result	The measurement was conducted according to the compliance conditions.	The selected measurement data meets the compliance conditions.	The measurement was conducted according to the compliance conditions.	The selected measurement data does not meet the compliance conditions. (Refer to *1)	The measurement was not conducted according to the compliance conditions. (Refer to *2)	Regardless of the results, if the result of Conformity Judgment of File is [Standard Non-Conform], all result of Conformity Judgment of Selected Data will be [No].	The measurement was conducted under user preset conditions,	The measurement data was acquired by using user preset conditions.
Example	Selected data 		Selected data 		Selected data 			

[Notes]

- When adding graph data from different files, it can be added if the units of the Y-axis/X-axis are the same. However, the preset conditions, including the standard compliance judgement of the destination file, will be those of the destination file.
- Compliance requirements for the standards vary depending on the additional features, so please refer to the instruction manuals for the respective additional features.

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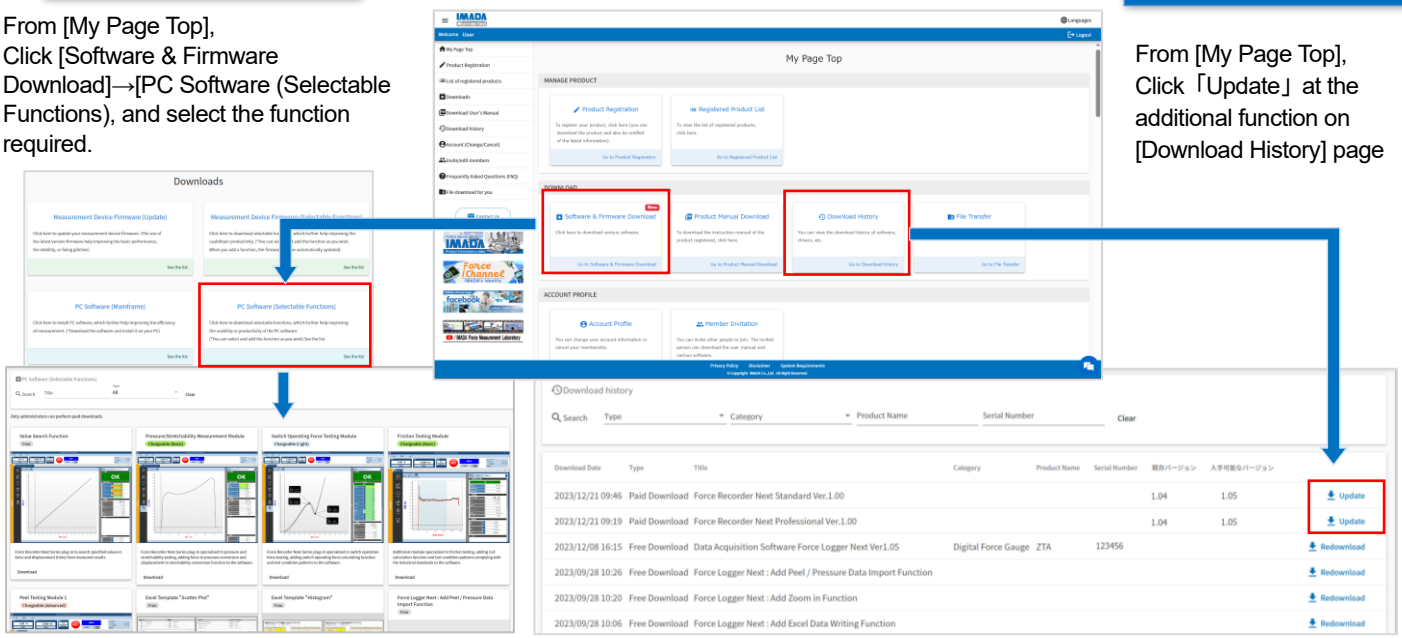
Update Functions

From [My Page Top], Click「Update」at the additional function on [Download History] page



Chargeable Download Cards for Additional Functions

Additional Function	Download Card Light	Download Card Basic	Download Card Advanced
Friction Testing Module		✔	
Peel Testing Module			✔
Pressure/Stretchability Measurement Module		✔	
Switch Operating Force Testing Module	✔		
Spring Rate Measurement Module		✔	
Deflection Correction Function		✔	
Bending Stress Measurement Module		✔	
Excel Data Writing Function		✔	

◎ For details of “Force Recorder Next Series”, please refer to the specification sheets. Specification sheets are available on each product page of our products and services website (QR code on the right).

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