Vibration Control System

K2+ -CE

Common Part Instruction Manual

Notes:

Before using this system, please read this instruction manual carefully to understand the contents thoroughly. After reading this manual, keep it in place so that can be read whenever required.

IMV CORPORATION

Type of Document : Instruction Manual

System Applied : K2+

Software < Application Software >

Later than Version 20.2.0

English Edition

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1.0.1	2021.01.15	Correction of misprints	
1.1.0	2021.02.01	Additional description of Overlaid graph of two types of data and the contact	
		output [LEVEL CHANGE] of Random	
1.2.0	2021.03.18	Additional description of Launcher settings menus and the field coil current	
		control at the low frequency of ISM.	
		Changed the description of Chapter 8 from Calibration to Condition Check.	

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Chapter 1 General information

1.1 Before Using this System

Thank you for purchasing IMV Vibration Control System.

This system is used for vibration control to vibration simulation systems and for vibration measurement.

This system has three principal functions.

1. Excite vibration simulation system

Output analogue drive signals from the dedicated hardware to vibration simulation system.

2. Measure vibration signals

Input analoge signals from sensors to the dedicated hardware and measure vibration signals.

3. Control vibration signals

Control drive signals that the measured signals are equal to the specified references.



This manual provides instructions that you must observe to ensure safe and proper handling of the vibration control system. Before using this system, please read this instruction manual carefully to understand the contents thoroughly.

After reading this manual, keep it in place so that you can read it whenever required.

The contents of this manual are subject to change without prior notice in the future.

It is possible to translate into the native language in the country where the vibration test system is used. If you hope, please contact IMV or our authorized dealer.

IMV Corporation has made constant efforts to provide correct information in this manual. However, if you have any question about the contents of this manual or find a mistake in writing, please contact us for improvement by E-mail.

E-mail: info@imv-tec.com

1.2 Safety Precautions

To use this vibration control system, please read this instruction manual and related manuals, and use thorough caution to ensure safe and proper handling of this system.

In this instruction manual, safety instructions are classified into the following categories.



Additionally, there might be some cases that the full ability or the normal action of vibration control system is not available because of the set condition. Please consider the combination of system with other equipment before the combined use.

1.2.1 Cautions

Please understand the following description, and observe the instructions without fail. Improper handling of this system may result in injury or property damage.

General cautions

- It is prohibited that the system is used as dismounted parts or a converted system.
- Do not block the air flow for air cooling systems. The cooling fans of the system are installed at the both side panels. More than 30mm of space is needed to be made around the air inlet.
- Do not set up the system at position where the power switch cannot be operated.
- Do not supply the input voltage more than the rating to the system.
- A suitable power cable for power supply voltage must be used for the system.
- The grounding cable must be connected to avoid the electric shock. This system is provided a power cable including the grounding wire. The grounding of the system is set through this power cable.
- Keep the system away from water, dusts, pieces of metal to avoid the fire and accident. Do not put the foreign objects inside of the system.

Installation place/conditions

For safety and proper use, the installation place for the system below should be avoided.

- Direct sunshine, the temperature rises higher.
- Dusty and enclosed place
- Corrosive and flammable gas environment
- Water and chemicals
- Direct effect of vibration or shock

Cleaning

- Do not use organic solvent such as thinner, benzene or alcohol for wiping the system. The parts of the system may deform or deteriorate.
- It is recommended that using waste cotton with a little water or mild detergent for wiping the system. The cables must be removed before wiping.

1.2.2 Warning Indication

To ensure safe and proper use of this system, and to prevent harm to the human body and life and property damage, instructions for each unit are indicated on the labels.

The indications and meanings of the labels are described below.

Before operating this system, be sure to understand the meaning of each label.

•Warning label

The following labels are affixed to this system. Do not stain or hide the warning labels so that operators can see them any time.

If you find a label damaged or peeled off, contact IMV or our authorized dealer.

1) Caution

Improperly handling this system regardless of the indication on this label causes a potentially hazardous condition, which may result in injury or property damage.

Even a condition classified as "Caution" may result in serious hazard depending on situations. All instructions provide important information. You must observe all instructions without fail.



Do not apply a voltage higher than the specified voltage to the terminals.



Caution label of K2+ (Front)



Caution label of K2+ (Rear)

1.3 Hardware Configuration

1.3.1 Computer

① Model to be used

IBM PC/AT (or complete compatible systems).

2 Requirements

•One LAN port

Gigabyte ethernet port and Gigabyte ethernet cable

- ·Windows 10 Pro(64bit) or Windows 10 IoT Enterprise(64bit) loaded*
- •Main memory in the PC (for the system having up to 8 input channels)*

More than 4GB

- ·10GB or more available hard disk space
- ·DVD-ROM Drive loaded (necessary at installation)
- •One USB port (necessary for protect device)

 $\boldsymbol{\cdot} \textbf{For Eco shaker}$

- •.Net Framework 4.6.1 has been installed (operation is not guaranteed with any other than this version.)
- ·One Built-in RS-232C port (9 pin D-sub connector)

The recommend 'USB to serial converter' can be used.

* Recommended OS and main memory varies depending on software, option and the number of input channels etc.

Example)

- ·When the optional software SHOCK/MEGA POINT is installed
 - For the system having over 5 input channels

More than 8GB

·When Multi-degree-of-freedom vibration control system is installed

More than 8GB

1.3.2 Dedicated Hardware I/O Unit

1) K2 [Standard Configuration (Number of Response Inputs : 4)]

① Small Cabinet	K2ST-10-021	x 1
Accessory	AC power cable	x 1
	Gigabyte ethernet cable	x 1 (1.0m[3.3ft] cable)
② Input/Output Module	K2ST-23-021	x 1

< appearance diagram >



Power Button and Lamp





K2+ (Rear)

1.4 Equipment Specification and Operation Conditioon

1.4.1 K2+

(1) Ambient Operating Temperature	$: 0 \sim 40^{\circ} C [32 \sim 104^{\circ} F]$
(2) Relative Humidity: Maximum	: 85%
(3) Altitude	: Up to 2000m [6561.7ft]
(4) Temperature at Transportation and	Storage : $-10 \sim 55^{\circ}$ C [$14 \sim 131^{\circ}$ F]
(5) Electrical Rating	: AC100-240V, 50/60Hz, 0.5A
(6) Voltage Tolerance	:+10%, -10%
(7) Overvoltage Category II according	g to IEC60664-1
(8) Pollution Degree 2 according to IE	EC60664-1
(9) European Directive	: Low Voltage Directive, 2014/35/EU(EN61010-1)
	EMC Directive 2014/30/EU(EN61000-6-2/EN61000-6-3,
	EN61000-3-2/EN61000-3-3)
	RoHS Directive 2011/65/EU (EN 50581)
(10) Number of slots	: 3 (possible to increase by connecting cabinets)
(11) Emergency Stop Function	: Available to set to ON/OFF and input polarity
(12) External Communication Function	n : Contact I/O : Input x 8, Output x 8
(13) Size	: 430(W) \times 383 (D) \times 100(H) mm
	$[16.9(W) \times 15.1 (D) \times 3.9 (H) in]$
	(not including the projection parts)
(14) Weight	: about 7.0kg [15.4lbs]

1.5 Hardware Specifications

1.5.1 Specifications

Control Signal Input Part

- (1) Number of Channels
- (2) Input Terminal
- (3) Input Format
- (4) Charge Amplifier Sensitivity
- (5) Cut-off of Charge Amplifier
- (6) Maximum Input

: Charge, Voltage(Single-ended/Differential), IEPE ty : 1.0 mV/pC or 10 mV/pC rr : 0.32 Hz : at Charge (1.0 mV/pC) input ± 10000 pC at Charge (10 mV/pC) input ± 1000 pC at Voltage input ± 10000 mV at IEPE input ± 10000 mV

Maximum input of Acquisition unit conversion

: 4+8xn (simultaneous sampling)

: BNC

Input format	Max. input (acquisition unit)
Charge (1.0 mV/pC)	10000/A
Charge (10 mV/pC)	1000/A
Voltage input	10000/A
IEPE input	10000/A

(A : Sensor sensitivity [mV/acquisition unit] or [pC/acquisition unit])

(7) Sampling Frequency	: Maximum 102.4 kHz		
(8) Coupling	: AC or DC		
(9) Cut-off at AC Coupling	: 0.1Hz		
(10) CCLD at IEPE	: +24V DC, 3.5mA		
(11) TEDS at IEPE	: Available (Ver0.9, Ver1.0)		
(12) A/D Converter	: Method $\Delta \Sigma$ method		ethod
	Resolution	32-bit	
	Dynamic range 121 dB		
	Digital filter	Ripple in pass band	1+0.001, -0.06 dB
	Rejection ban	d attenuation quantit	y 85 dB
(13) Frequency Characteristics : at Charge in		ut(1.0 mV/pC)	
	within ± 0).1dB	1 kHz
	at Voltage inp	out	
	within ± 0).1dB	1 kHz

Control Signal Output Part

(1) Number of Channels	: 4		
	(one of these channels is used as drive outp		
(2) Output Terminal	: BNC		
(3) Output Format	: Voltage		
(4) Maximum Output	$:\pm 10\ 000\ \mathrm{mV}$		
(5) Sampling Frequency	: Maximum 102.4 kHz		
(6) D/A Converter	: Method	$\Delta \Sigma$ method	
	Resolution	32-bit	
	Dynamic range	120 dB	
	Digital filter	Ripple in pass band $\pm 0.005 \text{ dB}$	
	Rejection band attenuation quantity 100 dB		

•External Input/Output Part

Remote Control Contact Input/Output Ports										
Connector	tor : 50-pole ribbon connector (female)									
	Parts used DDK 57RE-40500-730B(D29)-FA									
Input	: Isolated input 8-bit by photo coupler									
	Minimum current 3mA									
	Maximum current 50mA									
Output	: Relay output 8-bit at each A contact and B contact									
	Maximum current DC 1A (30V)									

	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
$\left\{ \right.$	STOP+ STOP-	08A 08A	O7A O7A	06A 06A	O5A O5A	04A 04A	O3A O3A	O2A O2A	OlA OlA	O8B O8B	O7B O7B	06B 06B	O5B O5B	O4B O4B	O3B O3B	O2B O2B	O1B O1B	I8- I8+	I7- I7+	I6- I6+	I5- I5+	I4- I4+	I3- I3+	I2- I2+	11- 11+
50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26																									
	Connector Pin Configuration (Remote Control Contact I/O Ports)																								

Input Circuit



Output Circuit



Emergency Stop Input Contacts

These contacts are for setting the drive output to zero compulsorily at emergency without using the software. 25 pin and 50 pin of Remote Control Contact I/O connecter pins are used as Emergency Stop Input Contacts.

The function of the drive output stop is realized by using the mute function of D/A converter and reduce the drive output with taking the time of 1024 sampling interval.

Canceling and switching the polarity of Emergency Stop Function are done by DIP switch.



1.5.2 Dedicated Hardware

(1) Input/Output Module (K2ST-23-021)

<Input>

Analogue signal acquisition by 4 Simultaneous Sampling Input Channels is available.

32 bit D/A converter of $\Delta \Sigma$ method is used.

The input formats generally supported are Charge Input and IEPE Input besides Voltage Input.

(Voltage Input, Charge Input and IEPE Input are changeable on the software.)

IEPE input supports the TEDS function.

Monitor Output Terminals are provided for every input channel.

Monitor Output Terminals are provided for every input channel.

The status and configuration of each channel is indicated by LED colour.

Green: Charge input channel

Blue: IEPE input channel

White: Voltage input channel (include Differential)

Red(Flush): Input channel error(ex. Loop check error)

<Output>

Analogue signal output including the excitation control drive signal for 4 Output Channel is available.

32 bit D/A converter of $\Delta \Sigma$ method is used.

The configuration of each channel is indicated by LED colour.

Green: Control drive output

Blue: Aux.output (SINE, RANDOM), Timing signal output (SHOCK)

<Common Items>

Maximum Sampling Frequency is 102.4 [kHz].

Each Input/Output circuit is protected by the relay device.

Remote Control Contact I/O function is available as a communication function to external equipments.



(2) Input Module (K2ST-23-022)

Analogue signal acquisition for 8 Simultaneous Sampling Input Channels is available.

32 bit D/A converter of $\Delta \Sigma$ method is used.

Maximum Sampling Frequency is 102.4 [kHz].

The input formats generally supported are Charge Input and IEPE Input besides Voltage Input.

(Voltage Input, Charge Input and IEPE Input are changeable on the software.)

IEPE input supports the TEDS function.

Monitor Output Terminals are provided for every input channel.

Each input circuit is protected by relay device.



The status and configuration of each channel is indicated by LED colour.

Green: Charge input channel

Blue: IEPE input channel

White: Voltage input channel (include Differential)

Red(Flush): Input channel error(ex. Loop check error)

1.6 Software Configuration

1.6.1 OS

Microsoft Windows 10 Pro(64bit), Windows 10 IoT Enterprise(64bit).

1.6.2 Application Software

(1) SINE

Software for excitation test system on the basis of sinusoidal wave given as data of frequency and excitation level

(2) RANDOM

Software for excitation test system on the basis of reference spectrum specified by PSD

(3) SOR (Sine On Random)

Software for excitation test system on the basis of reference spectrum specified by PSD and sinusoidal wave given as data of frequency and excitation level

(This software is an optional function which runs on RANDOM)

(4) ROR (Random On Random)

Software for excitation test system on the basis of reference spectrum in a broad and specified

by PSD and reference spectrum in a narrow band specified by PSD

(This software is an optional function which runs on RANDOM)

(5) SHOCK

Software for simultaneous excitation test system on the basis of pulse waveform data specified by each Test Specifications

Chapter 2 System Set Up and Maintenance

2.1 Installation

Set up and instruction of I/O unit as a dedicated hardware for K2+ system are described as below.

2.1.1 Environment for Installation

Note that the followings to set up the system ;

- Not to disturb the air for cooling the machine
 <u>Cooling fun of this machine are set on side panel.</u>
 <u>Please do not disturb the cooling air by putting things around the machine.</u>
- 2 Avoid direct sunlight
- ③ Set the system in fresh air

Refer to Chapter 1 System Configuration about the detailed specification for the consumption of electricity / environment of temperature.

2.1.2 Power Connect and Power Disconnect

Power Connect

Connect K2+ I/O Unit and the outlet by using the supplied power cable.

Power Disconnect

Disconnect the power cable from K2+ I/O Unit.

2.1.3 Connection to PC

The PC and the K2+ I/O Unit must be surely connected.

Type of bus	РС	I/O Unit
Gigabyte Ethernet	Gigabyte LAN Port	LAN port on the back of K2+ cabinet

2.1.3.1 Network setting

Normally, it is not necessary to change the IP address of the K2+I/O Unit from the factory settings.

If you need to make any changes, please refer to "Chapter 11 Communication with a hardware". The table below shows the factory default setting for the K2+ I/O Unit and recommended settings for the K2+ PC.

Item	PC for K2+	K2+I/O Unit			
IP address	192.168.200.231	192.168.200.232			
		(factory default setting)			
Subnet mask	255.255.255.0	255.255.255.0			
		(factory default setting)			

2.1.4 Connection to Excitation System

① Input : Signal cables of each pickup set to the shaker are connected to input terminals of front panel of the machine.

Please pay attention not to mistake the connection with pickups.

② Output :Output terminals of front panel of the machine and input terminal of the power

amplifier of the excitation system are connected by BNC cables.

Please pay attention not to mistake the connection with Power Amplifier.

2.2 Installation, Uninstallation and Update of Software

Refer to the separate "How to install software" booklet.

2.3 Other Settings

The description of items to be set on the other hardware is provided as below. However, you don't have to care about these items very much generally.

2.3.1 Emergency Stop Input Contact

The function of Emergency Stop Input Contact enables to reduce the drive output to zero compulsory (without using the software).

2.3.2 Changing of Input Mode

Three input modes as below are available for input channel of this system.

(1) Charge input

(2) Voltage input

(3) IEPE input

Changing of input is available to operate in each software.

2.3.3 ID Setting for Each Module

ID of each module is defined by the installed slot number of K2+ cabinet.

2.4 Startup and Stopping of System

General system operating procedures are shown below.

2.4.1 Startup of System

- <Procedures>
- <Step 1>

After checking that the power supply to the I/O Unit and the power amplifier is not turned on, turn on the power supply to the PC, and then, start up the Windows.

<Step 2>

After pressing the POWER button on the front of the K2+ I/O Unit and turning on to the power, turn on the power supply to the power amplifier.

<Step 3>

Start up the application. For the procedures of application startup, refer to "4.2.1 Application Start Up" in Chapter 4.

2.4.2 Stopping of System

<Procedures>

<Step 1>

Finish the application. To finish the application, refer to "4.2.2 Exit from Application"

<Step 2>

After turning off the power supply to the power amplifier, turn off the power supply to the K2+ I/O Unit.

There are two ways to turn off the K2+ I/O Unit:

• Press and hold the POWER button on the front of the K2+ I/O Unit (about 5 seconds).

• Select "K2+ hardware shutdown" in operation setting of K2+/Launcher.

<Step 3>

Finish the Windows, and then, turn off the power supply to the PC.

2.5 Inspection and Maintenance

This chapter describes daily inspections required for the vibration control system.

2.5.1 IMV's Inspection Policy

IMV Corporation has an inspection policy that users should maintain proper operating conditions of this system by themselves. Therefore, users must conduct daily inspections for this system. IMV and our authorized dealers offer inspection and maintenance services for this system. We recommend that this system should undergo inspection and maintenance once a year.

If you order our repair or maintenance service, or if you have any question, contact IMV or an authorized dealer of your purchased system.

When you contact us, enter necessary items in the contact form that comes with the system, and give us information on your request as detailed as possible

2.5.2 Daily Inspection

If you find abnormality about the following items, contact IMV or our authorized dealer.

Item	Description				
[1] Air inlet port	Check for dust clogging. If the air inlet port is clogged with dust, clear it off.				
[2] Fan	Check if the fan at the side panel of the system is running. If the fan is not running, contact IMV or authorized dealer.				
[3] Contact cleaning	Clean each terminal of each unit. Particularly, clean the ground cable connection terminals thoroughly.				
[4] Instruction manual	Check if the instruction manual is kept. If the instruction manual is lost, we will supply it at user's cost.				

2.5.3 Yearly Inspection

Item	Description						
[1] Air inlet port	Check for dust clogging. If the air inlet port is clogged with dust, clear it off.						
[2] Fan	Check if the fan at the side panel of the system is running.						
[3] Contact cleaning	Clean each terminal of each unit. Particularly, clean the ground cable connection terminals thoroughly.						
[4] Power Source	Check if power source voltage and frequency meet the specification.						
[5] Fixing screw	Check the fixing screws attaching a blank module panel to the I/O unit slot and the interface board to the PC. All of these fixing screws must be tighten.						
[6] Performance Check	Check the item in "2.7.3.1".						

2.5.3.1 Performance Check

Performance check is required to be operated for the items below.

- Input sensitivity
- Frequency
- Monitor output

The used measuring instrument :

Measuring instrument	Accuracy	Qty.
Voltmeter	AC voltage : within $\pm 0.7\%$ of mV range	1
Capacitor (1000pF)	Capacitance tolerance F	1
BNC cable, T connector		as needed

Measurement conditions :

1) Test mode	: SINE / manual
2) Frequency	: 80Hz
3) Drive voltage	: 500mV0-p (353.5mVrms)
4) Input type	: Voltage input (AC)
	Charge input (1mV/pC)
	Charge input (10mV/pC)

<Voltage input sensitivity test / monitoring output test>

Connection of the instruments

The connections of cables between each instrument are as below.



To the personal computer

- Connect [OUTPUT Ch1] to [INPUT Ch1] of the I/O UNIT by a BNC cable.
- (2) Connect [OUTPUT Ch1] to the voltmeter.
- (3) Connect [IF IN] or [INTERFACE] at the rear panel of the I/O UNIT to the personal computer.

Operate the performance check

- 1) Start up the K2+/SINE.
- 2) Select the manual operation of K2+/SINE.

Set conditions : output [80Hz 500mV]

input type [Voltage input (AC)]

input sensitivity for Ch.1 [5mV/(m/s²)]

- 3) Set the mode of the voltmeter to AC voltage measurement.
- 4) Start the operation by K2+.
- 5) Next, set the indicated value of the voltmeter to 353.5mV±0.5mV by adjusting the drive voltage of K2+. Record the value of the adjusted drive voltage to a check sheet.
- 6) Record these items indicated on the display ;

ACC (acceleration) $[m/s^2]$

- 7) Connect the voltmeter to [INPUT Ch1 MONITOR] as it is. Record the measured AC voltage.
- 8) Change the connection of [OUTPUT Ch1] to [INPUT Ch2] of the I/O UNIT. Also change the input setting of K2+ to Ch.2 from Ch.1. The input sensitivity of Ch.2 is the same as Ch.1.
- 9) Operate the same procedure as 3) \sim 7) and record the measured data.
- 10) These procedures are also needed to be operated for Ch.3 and Ch.4. When the optional input channels are added, the input channels Ch1. ~ Ch8 of the expansion board are also needed to be measured and recorded.
- <Charge input sensitivity test>

Connection of the instruments

Connect the equipment by the cables as in the same way as in the system of <Voltage input sensitivity test / monitoring output test> above. Also connect [INPUT Ch1] of the I/O input to the capacitor.



Operate the performance check

- 1) Record the capacitance of the used capacitor and calculate the input voltage by the equation.
 - C : Capacitance [pF]
 - V : Input voltage [mVrms]

 $V = 1000 \div C \times 353.5$

Example) Input voltage 354.4mV is obtained when the capacitance of the used capacitor is 997.4pF.

2) Select the manual operation.

Set conditions :

output [80Hz 500mV] input type [Charge input (1mV/pC)] input sensitivity for Ch.1 [5pC/(m/s²)]

- 3) Set the mode of the voltmeter to AC voltage measurement.
- 4) Start the operation by K2+.
- 5) Next, set the indicated value of the voltmeter to "the calculated value of 1)
 ±0.5mV" by adjusting the drive voltage of K2+. Record the value of the adjusted drive voltage to a check sheet.
- Record these items indicated on the display ; ACC (acceleration) [m/s²]
- 7) Change the connection of [OUTPUT Ch1] to [INPUT Ch2] of the I/O UNIT. Also change the input setting of K2+ to Ch.2 from Ch.1. The input sensitivity of Ch.2 is the same as Ch.1.
- 8) Operate the same procedure as 3^{6} , and record the measured data.
- 9) These procedures are needed to be operated also for Ch.3 and Ch.4. When the optional input channels are added, the input channels Ch1. ~ Ch8 of the expansion board are also needed to be measured and recorded.
- Change the input type to [Charge input (1mV/pC)] from [Charge input (10mV/pC)]. Operate the same procedure as [Charge input (1mV/pC)] and record the measured data.

Criterion

Accelerometer : 100.00m/s^2 within $\pm 2\%$ (98.00 ~ 102.00) Monitoring output : input voltage within $\pm 5\%$ (335.825~371.175)

<Check Sheet>

For conducted maintenance items next page, put a circle in the "Result" column.

If the system has a fault or damage, or if a defective part is replaced, enter the description in the "Remarks" column.

After checking all maintenance items, send this check sheet to us by E-mail.

 \bullet Check Sheet \bullet

Enter information on your vibration simulation system below.

Date:	_(year) (month) (day)	
Company name:		_
Department:		_
Person in charge:		_
Name of vibration control system:		
Serial No.:		

Daily Inspection

Maintenance item	Judgment criteria	Result (Yes/No)	Remarks
[1] Air inlet port	Is this item done?	Yes / No	
[2] Fan	Correctly running?	Yes / No	
[3] Contact cleaning	Is this item done?	Yes / No	
[4] Instruction manual	Available as needed?	Yes / No	

Yearly Inspection

Maintenance item	Judgment criteria	Result (Yes/No)	Remarks
[1] Air inlet port	Is this item done?	Yes / No	
[2] Fan	Correctly running?	Yes / No	
[3] Contact cleaning	Is this item done?	Yes / No	
[4] Power source	Satisfying the specification?	Yes / No	
[5] Fixing screw	Is this item done?	Yes / No	
[6] Performance check	Satisfying the criterion?	Yes / No	

Yearly Inspection (Performance Check)

		K2+	- for 4	-input	4-output	t modul	e			
SN No. :										
Module ID :										
The expansion unit for	r 8 chani	nel-inpu	t is used	•						
Voltage input sensitiv	ity test /	monitor	ing outp	ut test						
Input sensitivity : 5m	$V/(m/s^2)$	/ Input t	ype : Vo	ltage in	nput (AC					
Item		Î	• •	C	•	, ,				
Criterion		Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Result
Input volage (mVrms 353.5	s)									Measured value
Acceleration (m/s^2) 98.00 ~ 102.00 (100-	±2%)									OK / NG
Monitor output (mVi	rms)									
335.825~	,									OK / NG
371.175(353.5±5%)										
							u .		•	
Input sensitivity : 5pC	$\frac{ty}{2/(m/s^2)}$	Capacit	tor : C:			<u>(</u> pF) / Ir	put : ch	arge inp	ut (1mV	//pC)
Criterion		Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7	Ch 8	Result
Input voltage (mVrm	ns) :	011.1	011.2	011.5						i court
$\frac{1}{1000/C\times353.5}$ (mVr	ms)									Measured value
Acceleration (m/s^2)										OV / NG
98.00 ~ 102.00 (100=	±2%)									UK / NU
Input sensitivity : 5pC	C/(m/s ²) /	Capacit	tor : C:			<u>(</u> pF) / Ir	put : ch	arge inp	ut (10m	V/pC)
Criterion		Ch 1	Ch 2	Ch 2	Ch 4	Ch 5	Ch 6	Ch 7	Ch 8	Docult
Input voltage (mVrm	ne) ·	CII.1	CII.2	CII.5	CII.4					Kesuit
$\frac{1000/C\times353.5}{1000/C\times353.5}$	ms)									Measured value
Acceleration (m/s^2)	(115 <i>)</i>									OK / NC
98.00 ~ 102.00 (100=	±2%)									UK / NG
Manuality	4									
Name	ents Mor	أما	Serial	No	N	ame		Model	S	erial No
Voltmeter			Schar	110.	Canacito	$\frac{1000}{1000}$	nF)	WIGUCI	5	ornal NO.
Volumeter				Capacito	1 (1000)	pr)				
Remarks :	Remarks :									

	K2	2+ fo	r 8-inpu	ıt modu	ile (exp	ansion ı	ınit)			
									1 m	odule / 1 sheet
Module ID :										
Voltage input sensitivity test / monitoring output test Input sensitivity : 5mV/(m/s ²) / Input type : Voltage input (AC)										
Item										
Criterion		Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Result
Input volage (mVrms) 353.5										Measured value
Acceleration (m/s ²) 98.00 ~ 102.00 (100±2%)										OK / NG
Monitor output (mVrms) 335.825~371.175(353.5±5%)										OK / NG
Charge input sensitivity Input sensitivity : 5pC/(m/s ²) / Capacitor : C: (pF) / Input : charge input (1mV/pC)										
Item		_			_	. –				
Criterion		Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Result
Input voltage (mVrms) :										Measured
1000/C×353.5 (mVrms)										value
Acceleration (m/s ²) 98.00 ~ 102.00 (100 \pm 2%)										OK / NG
Input sensitivity : 5pC/(m/s ²) / Capacitor : C:(pF) / Input : charge input (10mV/pC)										
Item										
Criterion		Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Result
Input voltage (mVrms) :										Measured value
$1000/C \times 353.5 \text{ (mVrms)}$										
Acceleration (m/s ²) 98.00 \sim 102.00 (100 \pm 2%)										OK / NG
Maaan										
Measurement instruments					Jame		Model	1	Serial No	
Voltmeter							1110401		501101110.	
Capacitor (1000pF)										
Remarks :										

K2+ Sprint										
SN No. :										
Voltage input sensitivity test / monitoring output test Input sensitivity : 5mV/(m/s ²) / Input type : Voltage input (AC)										
Item										
Criterion		Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Result
Input volage (mVrms) 353.5										Measured value
Acceleration (m/s ²) 98.00 ~ 102.00 (100±2%)										OK / NG
Monitor output (mVrms) 335.825~371.175(353.5±5%)										OK / NG
Charge input sensitivity Input sensitivity : 5pC/(m/s ²) / Capacitor : C:(pF) / Input : charge input (1mV/pC) Item										
Criterion		Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Result
Input voltage (mVrms) :										Measured
1000/C×353.5 (mVrms)										value
Acceleration (m/s^2) 98.00 ~ 102.00 (100+2%)				\searrow						OK / NG
Input sensitivity : $5pC/(m/s^2)$ / Capacitor : C:(pF) / Input : charge input (10mV/pC)										
Item		Ch 1	Ch 2	Ch 2	Ch 4	Ch 5	Ch 6	Ch 7	Ch 9	Degult
Criterion		Cn.1	Cn.2	Cn.5	Cn.4	Cn.5		Cn. /		Result
										Measured value
$\frac{1000/C \times 353.5 \text{ (mVrms)}}{\text{A conformation } (m/s^2)}$										
Acceleration (m/s) $98.00 \sim 102.00 (100\pm2\%)$										OK / NG
Maggurament instrume	nta									
Name Model		el Serial No.			Name			Model		Serial No.
Voltmeter										
Capacitor (1000pF)										
Remarks :										
2.6 Warranty and After-sales Services

2.6.1 Warranty

IMV Corporation conducted strict tests and inspections for this system before shipment, to verify that the system performance meets the rated values.

We shall warrant this system as follows:

(1)Period of warranty

The warranty period shall be 12 months from the date of arrival of this system at a port of the import country, or 18 months from the date of shipment from Japan, whichever is shorter. But the warranty term and condition defined within each sales contract shall prevail.

(2)Scope of warranty

The scope of warranty covers repairs and parts replacement in case of a failure attributable to our design or manufacturing quality. A failure caused by natural disaster or improper handling is excluded.

However, we intend to offer quick and correct after-sales services even after expiration of the warranty period.

(3)Exceptions from liability

The following items shall be out of the scope of our liability, even within the warranty period.

- 1) An accident attributable to the user's appurtenant work for this system (fall down, power supply, grounding, etc.)
- 2) An accident attributable to the user's external environmental conditions for example Exhaust duct, power supply, grounding, air source, etc.
- 3) An accident caused by use under conditions out of the specified range
- 4)An accident caused by exposure to direct sunlight, water leak, corrosive environment containing chemical or salt, or other particular environment
- 5) An accident caused by an extraordinary handling manner, or by negligence in observing the instructions given in this manual
- 6) An accident during transportation or loading work, or damage caused by improper operation or forced operation
- 7) An accident caused by natural disaster

If you order our repair or maintenance service, or if you have any question, contact IMV or an authorized dealer of your purchased system.

When you contact us, enter necessary items in the contact form that comes with the system, and give us information on your request as detailed as possible.

IMV CORPORATION

<Overseas Sales Planning Division> 2-6-10 Takejima Nishiyodogawa-ku, Osaka 555-0011, Japan TEL. +81-6-6478-2580/fax. +81-6-6478-2537

<IMV CORPORATION Shanghai Representative Office > 1559 L'Avenue 99 Xian Xia Rd. Shanghai, 200051 PRC TEL. +86-0-21-6057-7069

<IMV (THAILAND) CO., LTD.>

Amata City Chonburi Industrial Estate Phase 9, 700/907 Moo 5, Tambol Nhongkakha, Amphur Phanthong, Chonburi Province, 20160 Thailand TEL. +66(0)3821-2226

<IMV EUROPE LIMITED>

1 Dunsbridge Business Park, Shepreth, Royston, Herts, SG8 6RA, United Kingdom TEL. +44(0)1763 269978/E-mail <u>info@imv-tec.com</u>

<IMV EUROPE LIMITED German Sales Office> Landsberger Str. 406, D-81241 Munich, Germany TEL. +49(0)89-21-545-9900

<IMV America, Inc.> 11520 Blair St., Holland, MI 49424 USA.

TEL. +1-657-272-0270

<IMV TECHNO VIETNAM COMPANY LIMITED>

Factory No.13, Apartment Factory No.2, Plot P-7, Thang Long Industrial Park I, Vong La, Dong Anh, Hanoi, Vietnam

TEL. +84 (0)24 3956 0777

<IMV France>

1 rue George Stephenson 78180 Montigny Le Bretonneux, France TEL. +33-0-130124792

2.6.3 Contact Form

[1] Enter necessary items in the contact form, and contact us by E-mail.

E-mail address: info@imv-tec.co.com



[2] After receipt of your request, we will contact you.

Date	
Company name	
Department	
Person in charge	
Zip code	
Country	
Address	
Phone number	
E-mail:	Fax number:
Type of request (Check your request item.)
Name of vibration control system	
Serial No.	
Contents of request	

- If you order repair service, specify the name and model of the product to be repaired and trouble conditions.
- After receipt of your request by E-mail, IMV will contact you. Please understand that our reply may be somewhat delayed if the company has a holiday.

EU DECLARATION OF CONFORMITY (ORIGINAL)

We, the undersigned,

Manufacturer	IMV CORPORATION	
Address	2-6-10 Takejima, Nishiyodogawa-ku, Osaka 555-0011 JAPAN	
Country	JAPAN	
Phone number	+81-6-6478-2565	1
Facsimile number	+81-6-6478-2567	

under our sole responsibility, declare that the following apparatus,

Equipment	Vibration Control System			
Model No.	K2+			

complies with the provisions of following Directives as completed equipment under evaluation of conformity based on the following harmonized standards.

Low Voltage Directive 2014/35/EU	EN 61010-1:2010/A1:2019
EMC Directive 2014/30/EU	EN 61000-6-2:2005 EN 61000-6-4:2007+A1:2011 EN 61000-3-2:2014 EN 61000-3-3:2013
RoHS Directive 2011/65/EU	EN 50581:2012

Year of affixing CE marking	2020
Place and date of declaration	Osaka, JAPAN; 9 October 2020
Signature, name and title of person empowered to draw up the declaration	Hidenao Aolci Divector

Chapter 3 Setting of K2+ System

3.1 Environment Setting

In Environment Setting, I/O Unit Information, Excitation System Rating Information and the definition information of sensor specifications generally used are defined.



3.2 I/O Module Configuration

ID number and the type of I/O Module (Input/output board and Input board) that constructs K2+ I/O Unit are displayed.

< I/O Module Configuration change >

The display is to be updated to the latest information by pressing the [**Renew**] button on the right of the list of I/O Module Configuration when the K2+ I/O Unit Configuration is changed.

Before renewing the information, I/O Unit should be connected to the current PC by the dedicated cable and power must be turned on.

When the test initialization is impossible to operate after changing the configuration of I/O Unit, execute the command of "Another Excitation System Information loading" process described in Chapter



3.3 Excitation Information

This item is necessary to be defined.

A defined 'Excitation System Information' is required to be selected when the application of SINE or RANDOM is to be executed.

Mainly, the rating information of the shaker used in Excitation System is registered.

The method of registration is described as below ;

Press the [Add] button on the right of the list displaying Excitation System Information. A dialog for the registration appears.

Excitation System Information									
Excitation Syste	m Information nam	e A74/	ЕМ8НАМ					ОК	
Drive output M	Iodule 000	▼ Ch	No. Ch1	•	Polarity 🎯 +	© -		Cancel	
Initial output vo	Initial output voltage default value 30.0 🚔 mV ms Armature Mass 74.0 🚔 kg 🗸								
- Rating Inform	Rating Information								
Control fre	quency range is lin	nited.							
						Load fr	rom system model(<u>S)</u>	Other control quantities	
	Rated Force		Acceleration		Velocity		Displacement		
	kN 👻		m/s² 🗸	•	m/s 👻		mm 👻		
SINE	74.0	0-р	1002.0	0-р	2.050	0-р	77.20 🍝 p-p		
RANDOM	74.0	ms	632.0	ms	2.050	0-р	77.20 🌲 _{p-p}		
SHOCK	180.0	0-р	2434.0	0-р	2.550	0-р	77.20 p-p		
HV-SHOCK	160.0	0-р	2164.0	0-р	3.60	0-р	77.20 🌪 p-p		
Contact I/O Info	ormation Undefin	ned []	Define(<u>D)</u>	ihange(<u>/</u>) Cancel(<u>R</u>				

3.3.1 Excitation System Information name

(1) Meaning

This item is for inputting of the registration name of the excitation system (shaker + amplifier) to be used.

3.3.2 Drive Output

(1) Meaning

This item is for specifying of 'Module ID' and 'Ch. (number of output channel)' of I/O Module to be used.

3.3.3 Polarity

(1) Meaning

This item is for setting of the polarity of output channel to be used.

The default value of this item is defined as 'Positive'. The default value is recommended if it is not intended.

When this item is set to 'Negative', the output signal of output channel is treated as that having the negative polarity.

3.3.4 Initial Output Voltage Default Value

(1) Meaning

This item is for setting of a default value for the voltage of the loop check operation at the beginning of control operation.

This default value can be changed in each application.

Please use a suitable value generally for the excitation system to be used.

3.3.5 Rating Information

(1) Meaning

This item is for setting of maximum rating data (Max. Acceleration, Max. Velocity, Max. Displacement) of excitation system to be used.

The rating of excitation system varies according to the characteristics of control signals. So, the specification of this item is for setting the values of each program, such as SINE,

RANDOM, SHOCK independently.

'HV-SHOCK' is optional.

3.3.5.1 Load from system model

(1) Meaning

The system rating information is set automatically by selecting a model from the list of excitation systems provided.

3.3.6 Control Frequency Range is limited

(1) Meaning

This item is for setting of the upper and the lower limit of range for the control objective of the excitation system to be used.

When this item is set, the reference having the band out of the range set by this item is controlled in each application.

Please set this item according to the frequency range of the excitation system to be used.

3.3.7 Other Control Quantities

(1) Meaning

This item is for setting of the maximum rating data when the excitation system is to be controlled by other physical quantity than acceleration, velocity and displacement.

3.3.8 Contact I/O

(1) Meaning

This item is for setting of input/output when an external equipment connects with K2+ system at a contact in a composite test.

Refer to Contact I/O Information about the setting method.

3.3.9 Armature mass

(1) Meaning

This item is for setting of the armature mass of the shaker. The armature mass is used for the excitation force check in the application software, such as SINE.

3.4 Input Channel Information

This is not a must item to be defined.

This item is to be set in either methods that selecting an input channel information among the defined information or creating it in each application.

However, it is necessary to be defined beforehand when the function of Simplified Definition is used.

The setting information concerning with the specification of a sensor generally used is registered.

In K2+ application, adding and changing of input channel information are available in test definition file creation.

Jul Environment Infor	nation name Input						UK
Channel name	Module ID	Ch	Sensitivity	Input type	Polarity	-	Cancel
Ch0-1	000	Ch1	3.0 pC/(m/s²)	Charge input (1 mv/pC)	Positive		
.h0-2	000	Ch2	3.0 pC/(m/s ²)	Charge input (1 mv/pC)	Positive	E	
.h0-3	000	Ch3	3.0 pC/(m/s ²)	Charge input (1 mv/pC)	Positive		
3h0-4	000	Ch4	3.0 pC/(m/s ²)	Charge input (1 mv/pC)	Positive		Delete
h1-1	001	Ch1	3.0 pC/(m/s ²)	Charge input (1 mv/pC)	Positive		Delete
h1-2	001	Ch2	3.0 pC/(m/s ²)	Charge input (1 mv/pC)	Positive		
h1-3	001	Ch3	3.0 pC/(m/s ²)	Charge input (1 mv/pC)	Positive	-	
h1.4	(1)1	(1)/	3 [] n[//m /e2]	(hame input (1 my/n()	Poetiva		TEDS Update
nput Channel Informa	tion						
nput Channel Informa Name Ch0-1	tion	dule 000	← Ch Ch1	▼ <u>A</u> dd			
nput Channel Informa Name Ch0-1 Quantity Accelerat	tion Mo ion v Inp	dule 000 ut type Cha	← Ch Ch1 inge input (1 mv/pC)	 ▲dd Understand Understand 			
Input Channel Informa Name Ch0-1 Quantity Accelerat Sensitivity	tion Mo ion ▼ Inp 3.0 ← pC/(m/s	dule 000 ut type Cha	← Ch Ch1 rge input (1 mv/pC) Cal. cancel(R)	 ▲dd Ehange TEDS Access(E) 			

[Add]	A new input channel is added.
[Change]	Defined content of a selected input channel is changed.
[Delete]	A selected input channel is deleted from the registration list.
	The registered order just has the meaning of the order of a graph to be
displayed.	
[TESD Update]	This button captures and automatically sets the input sensitivity of the IEPE
	input channel information registered in the input environment information from
	the connected IEPE sensor corresponding TEDS.

3.4.1 Input Environment Information Name

(1) Meaning

This item is for inputting the registration name of Input Environment Information to be used.

3.4.2 Name (Channel Name)

(1) Meaning

This item is for inputting the registration name of input channel.

3.4.3 Module / Ch.

(1) Meaning

This item is for setting of Module ID and number of Input Channel for I/O module or Input module to be used.

3.4.4 Quantities

(1) Meaning

This item is for setting of the physical quantity as the measurement objective of the sensor to be used.

3.4.5 Input Type

(1) Meaning

This item is for setting of the type of a sensor signal to be used as an electric signal when it is inputted to K2+ system.

Three types of input format as below are supported for I/O Board or Input Board ;

1. AC Voltage Input	:	± 10	V FS
---------------------	---	----------	------

- 2. DC Voltage Input : ± 10 V FS
- 3. Charge Input : $\pm 10000 \text{ pC FS}$ (charge amplifier gain 1mV/pC)
- 4. Charge Input : $\pm 1000 \text{ pC FS}$ (charge amplifier gain 10 mV/pC)
- 5. IEPE Input : ± 10 V FS

'Charge Input' is selected when the acceleration pickup output of charge output type is directly connected to the I/O Module or Input Module.

I/O Module and Input Module are available to select both of gains because these modules have a charge amplifier for converting Charge/Voltage internally.

Please select a suitable gain according to the maximum acceleration level generated in the test to be operated.

To connect the IEPE output type acceleration pickup output directly to the I/O module or input module, select 'IEPE input'.

A CCLD amp (+ 24 VDC, 3.5 mA) is built in the I/O module or input module.

When other sensors are to be used, the voltage signal obtained by operating all the proper voltage conversion should be inputted. This item is to be set to 'Voltage Input'.

3.4.6 Sensitivity

(1) Meaning

This item is for setting of input sensitivity of the signal inputted to the input channel to be used.

3.4.7 Polarity

(1) Meaning

This item is for specifying of polarity of input channel to be used.

When this item is set to 'Negative', the input signal of input channel is treated as a signal

having the negative polarity. (That is, the data obtained after A/D converting multiplied -1.)

The default value of this item is set to 'Positive'.

3.4.8 TEDS Access

(1) Meaning

Input sensitivity is captured and automatically set from the connected sensor corresponding TEDS.

This function is enabled when the input type is IEPE.

Chapter 4 Fundamental Operation Method

4.1 Outline

In K2+ application, operation after booting up is executed by using the keyboard and the mouse. The window displayed as below appears when this application is started.

The names of all menus available in this application are displayed at the menu bar. A list of available commands appears by clicking each name of menus.

Each tool bar displays the commands that are frequently used in the menu as icons.

When an icon is clicked, the command corresponding with this icon is operated or the dialog box corresponding with this command is opened.

Operation condition of K2+ Controller is displayed in the status bar.

Condition during Excitation Operation is displayed in Operation Status Panel.



4.2 Fundamental Operation

4.2.1 Application Start Up

<Procedures>

<Step 1>

Double-click the "K2+Launcher" on the desk top screen.



<Step 2>

The K2+/Launcher is started.

Select the icon of the application to be started, and press the button of [Next].



4.2.2 Exit from Application

(1) K2+/Launcher

Press the button [Close] on the screen.



(2) Other applications

Following procedures are provided to exit from K2+ application. In this clause, it describes the procedures to close the application by using the close button and using the command in the menu bar.

① Procedure of closing by Close Button

The application is ended by clicking the close button on the upper corner of the right in the window in Test Definition mode.



② Procedure of closing by the command in Menu Bar

Select [File] in the menu bar in Test Definition mode. The commands of [File] appear. The application is ended by selecting [Exit] among the commands.



4.2.3 Description of Icons

The commands that frequently used in the menu bar are displayed as icons on the tool bar below the menu bar. When an icon is clicked, a command corresponding with the icon is executed immediately or a dialog box corresponding with this command is opened.

Actions of the system when each button of the tool bar is pressed are described as follows ;



This command is for creating a new test. Test Definition (Test Condition, Test Contents) is newly defined.



This commend is for generating a new test in simplified definition mode. The contents of definition are limited but it is easy to be defined. (SINE, RANDOM, SHOCK)



This command is for opening the saved Test Definition file.



This command is for saving Test Definition of an operation objective in a file.



This command is for saving Data in a file.



Print



Print preview



Report generation on Mictosoft Word



Quick report generation on web browser or Microsoft Word(Quick Report)



This command is for proceeding to Test Operation mode from Test Definition mode.

When Test Definition is not completed or inconsistencies are detected in Test Definition, the system cannot proceed to Test Operation mode.



This command is for proceeding to Test Definition mode from Test Operation mode.

In case of aborting the test, Operation Status, Continuous Excitation Data, Graph



This command is for starting the excitation or the acquisition operation. (SINE, RANDOM, CAPTURE)

In case of SHOCK, the action executed by this commend is decided according to the status.

Waiting for the XFR Measurement start : XFR function is to be measured. Drive Generation : Drive waveform data is generated from the reference data and Inverse XFR function.

Waiting for Excitation Start : Excitationnoperation is to be started.



When the test operation is stopped by the command of user or by detecting abnormal phenomenon, the button of [Retry] is set to valid.

This command is for proceeding to the waiting state for excitation /capture start by pressing this button after the test operation is stopped.



This command is for stopping of the test in operation.



This command is for pausing of the test in operation without the excitation.



This command is for canceling the paused state and continuing the excitation.



This Command is for operating Sensitivity Calibration of a pickup during the operation of a manual test. (Available only in SINE.)



This command is for excitation start by level scheduling. (Available only in SHOCK)



This command is for restart the excitation by level scheduling. (Available only in SHOCK)



Capturing is started by inputting Manual Trigger. (Available only in CAPTURE)



Undo the editing process operated to the data. (Available only in CAPTURE)



Calculation between numeral values is operated to the waveform data. (Available only in CAPTURE)



Edging process that makes the beginning and the ending point of waveform data smooth to zero is operated. (Available only in CAPTURE)



Data Length is converted by trimming the waveform data. (Available only in CAPTURE)



Filtering process is operated to the waveform data. (Available only in CAPTURE)



Frequency conversion of waveform data is operated. (Available only in CAPTURE)

4.2.4 File Operation

File management dialog in K2+ application is described as below.

4.2.4.1 File Open

The dialog shown as below appears by the following procedures ; Select [File] in the menu bar and click [Open], or click the icon of [Open] in the tool bar.

		Select a displa	ly type for file discri	ption	
2 Open					
Look in:	My Docume	ents	- @ Ø 🕫 🛄-		
(Ang	Name	^	Date modified	Туре	Size
2	TestSweep	o.swp2	7/22/2013 1:56 PM	SWP2 File	
Libraries Computer					
Network	•		III		•
HELWOIK	File <u>n</u> ame:	TestSweep		• (Open
	Files of type:	Sweep test definition file(*.	swp2)	•	Cancel
	Comment				*

4.2.4.2 Save As

The dialog shown as below appears by the following procedures ;

Select [File] in the menu bar and click [Save as],

or operating the function of [Save] to save a new Test Definition File.

😳 Save As						×
Save in:	My Documer	nts	•	G 👂 📂 🛄 -		
æ.	Name	^		Date modified	Туре	Size
Recent Places Desktop Libraries Computer	TestSweep.	swp2		7/22/2013 1:56 PM	SWP2 File	
Naturali	•					- F
Network	File name:	TestSweep2			•	Save
	Save as type:	Sweep test definition	n file(*.swp2)		•	Cancel
	Comment			<u></u>		*
			A comm	ent can also be sav	red with a file	e name.

A comment can be inputted if it is necessary.

(In the dialog box for processing files dedicated to this system, 'Comment' to be inputted are used as comments of a file literally.)

4.2.5 Add a Page

This function is for adding of the pages for displaying graphs and logs in a manner which is frequently used in scratchpad software like EXCEL.

```
< Procedures >
```

```
< Step 1 >
```

Select [Window] in the menu bar and click [Add a Page].



< Step 2 >

The picture as follows shows the display after executing the function of 'Add a Page'.



< Others > Rename the page

A name of the additional page can be changed by double clicking on the tab of the page in the display when it is necessary.

😨 C:\User	s\IMV\Docu	iments\Te	stSweep.sv	vp2 - K2/S	ine			
File(F) T	est definitio	n(T) Op	eration(P)	Edit(E)	View(V)	Window(W)	Option(O)	Help(H)
New	Simple	0000	Test care	Lug Data cau	Drint	Province	W	
2 INEW	Simple	Open	Test save	Data sav	e Print	Preview	Report 3	Ope, start
Freque	ncy R	leference	Resp	onse	Drive		ĥ	
	LI-						IJ	
	T IZ					V 0-0		
	Test de	finition	Reference	e Pag	24			~
	Control	referen	ce/respo	nse	SI SI	olit direction(S)	•	*
). 😭 🗐		A	rrange window	(A)	
Next			-v 💼 🚥		Le	eft rotation(L)		- 2
					Ri	ghet rotation(F	0	
	1000.0	m/s ²				<u>,</u>		
Change					N	ame change(N) 🗶	
					C	opy to clipboa	rd(C)	
					c	lose(X)		
Add								
Aug o						/		

"Name change" window is displayed below;



4.2.6 Palette Operation

K2+ application provides the function that the display space (a palette) of graphs and logs can easily be moved or copied.

4.2.6.1 Palette Tool Icons

Commands used for handling pallets are indicated by icons on the lower part of graph display area. When any icon is clicked, corresponding command is executed immediately.

F	
L	
L	
L	
L	

Pallets are indicated split horizontally. (Refer to "4.2.6.2 Moving the Palette")



Pallets are indicated split vertically. (Refer to "4.2.6.2 Moving the Palette")



Pallets are indicated split in a grid pattern. (Refer to "4.2.6.2 Moving the Palette")



Positions of displayed some pallets are changed by turning them counterclockwise. (Refer to "4.2.6.2 Moving the Palette")

r*		
	-	

Positions of displayed some pallets are changed by turning them clockwise. (Refer to "4.2.6.2 Moving the Palette")



Deletes pallets.

4.2.6.2 Moving the Palette

Palette can be moved by operating the palette operation button provided at the bottom of the displayed page.



4.2.7 Other Operations

4.2.7.1 Set Up

In this clause, set up method of both Test Definition mode and Test Operation mode is described.

The set up methods vary depending on each application. Refer to the instruction manual of each application about the details.

4.2.7.2 Operation Status

The status of control in operation is displayed.

C:\Users\IMV\Documents\TestSweep.swp2 - K2/Sine								
File(<u>F</u>)	Test definition(<u>T</u>)	Operation(<u>P</u>)	Edit(<u>E</u>)	View(<u>V</u>)	Window(<u>W</u>	/) Option((D) Help(<u>H</u>))
New	Simple Op	en Test save	Data save	Print	Preview	Report	Ope. star	t Ope.
Fregu	iency Refere	nce Resp	onse	Drive	Ela	apsed time	Vibration Cyc	de
	13.02 1.	6941 1	6602		5.4	0:00:05	,	21
	Hz m	/s ² 0.0 n	n/s²0.p	m\	(00		cvc	le
<u></u>			40 OP				0,0	
	Reference/	Response <mark>O</mark>	peration	n status				
	Operation s	status	_		_	_	_	
Next	In excitation	1 1						
	Frequency	13.02 Hz	20	013/07/22	2 2:03:36 P	M		
	Ref.(m/s ² 0-p) Res	p.(m/s² 0 ₁ 1 6602	o)	Drive(m	iV)		
Change	Elenand time		1.0002	1 ovolo	0.4			
F.	Sweep F	orward(F)	1/10	double-s	weep			
	Manual	0.00 dB	Sweep	rate mag	gnification	1.0		
Add	Check result		A	larm	OK	Abort	OK	
	Real-time pr	ocessing CPL	load fac	tor	0.15 %			
	Reference/F	Response data	а					
Delete	A	cceleration		Velocity		Displacem	nent	
	Def	(m/s²)		(m/s)		(mm)		
OFF	Resp.	1.6602		2.072e-2 2.030e-2		0.4965		
Undefined	d					0.1000		
	Input channe	l data						
	Peak est	imation	Acceler	ation	Ve	elocity	Disn	laceme

4.2.7.3 Manual Operation

The control reference can be changed during the excitation by using manual operation box. The set up methods vary depending on each application. Refer to the instruction manual of each application about the details.

4.3 Graph Operation

It describes about items that are used for graph operations such as selecting of graph display and changing of scale as below.

4.3.1 Graph Tool Icons

Commands used for handling graphs are indicated by icons on the upper part of graph display area. When any icon is clicked, command corresponding to the icon will be executed immediately, or a dialogue box corresponding to the command appears.

-	~	14	
-		u	
\sim	а.	ч	
-	-		
-	_	-	
	4	4	

Moves in graph display area leftward.



Moves in graph display area rightward.



Moves in graph display area upward.



Moves in graph display area downward.



Changes graph zooming by dragging. (Zooming horizontally only, vertically only, and in both directions are allowed)



Changes graph scale. (Refer to "4.3.3 Scale")



Returns scale to the initial status.



Displays a cursor. (Refer to "4.3.4 Cursor Display")



Changes the currently displayed graph. (Refer to "4.3.5 Graph Change")



Converts a graph into CSV data. (Refer to "4.5.1 File conversion to CSV")



Outputs a graph on Excel. (Refer to "4.5.2 Graph display on Excel")



Displays peak marks. (Refer to "4.3.6 Peak Mark")



Displays legends.

4.3.2 Selecting of Graph Display

A graph is displayed by selecting the data from the data of Test Definition and Test Operation.

- < Procedures >
- < Step 1 >

Select "Window" in the menu bar and click "Graph" among the items.

6	New de	finition -	K2/Sine							
F	ile(F) Te	est defini	tion(T) Ope	eration(P)	Edit(E)	View(V)	Window(V	V) Option(O) Help(H)	
	NW	E			Lub		Add	a page(P)		X
	C C	6					Test	definition(D)		Ex an
	New	Simple	Open	Test save	Data sav	e Print	Oper	ation status(S)		Ope.
	Frequer	ncy	Reference	Resp	onse	Drive	Grap	h(G)		le
	1	0.00	1.0		0.0		Histo	ory(L)	Ň	0
		Hz	m/s² 0-p) n	n/s² 0-p	mV	0-р		② ,c	le
		Refer	ence/Resp	oonse <mark>O</mark>	peratio	n status				
		0								

< Step 2 >

Select one item each in the list of Graph type and another descriptions and press the [OK] button.

aph type selection			
Control reference/respon Monitor Drive Fransmissibility [Respons Fransmissibility [Monitor]	ise ie]		OK Cancel
Monitor Distortion			
Monitor Distortion	2 Additional display	Display unit	
Monitor Distortion Display type © Reference	Additional display Alarm tolerance	Display unit	
Monitor Distortion Display type Reference Response	Additional display Alarm tolerance	Display unit Acc. Vel.	

< Step 3 >

A graph of the page displayed currently appears in the display.



4.3.2.1 Selecting of 3D graph

Three types of 3D graphs are available. Applications applicable to the 3D graphs are shown below.

- Waterfall graph (depth fixing)
 SINE (SPOT test is unavailable), RANDOM, SHOCK, CAPTURE, DATA
 VIEWER
- [2] Waterfall graph (Scroll display)SINE (SPOT test is unavailable), RANDOM, SHOCK
- [3] Color map DATA VIEWER This section explains how to display waterfall graphs. (For details of [3] Color map, refer to "Chapter 6 DATA VIEWER".)

[1] Waterfall graph (depth fixing)

Types of graphs applicable to this graph are as shown below.

SINE:	Monitor, Transmissibility[Monitor], Monitor Distortion
RANDOM:	PSD[Monitor], Transmissibility[Monitor], Sine Data[Monitor]
SHOCK:	Monitor, Transmissibility[Monitor]
CAPTURE:	Waveform, PSD, Transmissibility[Monitor]
DATA VIEWER:	Graph types of the above applications

The following is the explanation of display procedures taking SINE monitor graph as an example.

< Procedure >

< Step 1 >

Proceed to < Step 2 > of the selection of graph to be displayed in the former "section 4.3.2".

< Step 2 >

Select "Waterfall graph" from Graph type, and press [OK] button. (For DATA VIEWER only, "Color map" can be selected here.)

Graph type selection	×
Control reference/response Monitor Drive Transmissibility [Response] Transmissibility [Monitor] Monitor Distortion	OK Cancel
Display channel unit m/s²	Additional display concerning to Reference/Response
Additional display	Response
Ch1	Reference alarm tolerance
Ch2 Display type Ch3	Reference abort tolerance
	Additional display concerning to monitoring
	Monitoring alarm tolerance
All Chainles	Monitoring abort tolerance
Display unit	Additional display concerning to reference relative
í Acc. ⊘ Vel. ⊘ Disp.	Abort tolerance

< Step 3 >



Additional graph appears on the currently displayed page.

[2] Waterfall graph (scroll display)

New data is added foremost, and the past data is withdrawn sequentially.

When the number of displayed data reaches the maximum number of depth data, the oldest data is deleted whenever new data is added.

The following is the conditions for data addition.

SINE, SOR:	When single sweep is completed
RANDOM:	At loop renewal
SHOCK:	When excitation is finished

Notes)

Data before waterfall graph (scroll display) is displayed will not be drawn. If the type or the maximum number of depth data is changed by "Graph Change"

button, data will be initialized, and deleted completely.

< Procedure >

< Step 1 >

Select "Window" in the menu bar, and click "Waterfall graph".

🤬 New def	finition -	K2/Sine						
File(F) Te	est definit	tion(T) Opera	ation(P) Edit(E)	View(V)	Window(W) Option(O)	Help(H)	
	E	Tan I			Add	a page(P)		
	6				Test	definition(D)	Ĩ.	
New	Simple	Open T	est save Data sav	e Print	Оре	ration status(S)	L. L.	D. end
Frequen	ICV	Reference	Response	Drive	Grap	oh(G)	е	
2000	0.00	1.0	1.0031		Wat	erfall graph(W)	▲ .	••
2000		1.0	1.0051		Hist	ory(L)		×̈́́́́́́
	Hz	m/s* 0-p	m/s² 0-p	۳V	υp		cycie	
	Refer	ence/Respo	onse Operatio	n status	Page3			
	Monit	or						
Next		🔺 🛯 🖓	🖀 💶 🖀 🛛	😚 🔤 (X			

< Step 2 >

Select graph type and depth axis data, and set up the maximum number of depth data. If "Monitor" is selected as displayed data, select your desired input channel. After all the setup is complete, press [OK] button.



< Step 3 >

Additional graphs appear on the currently displayed page. (At this time, data line is not drawn.)



When the conditions for data addition described above are satisfied, data is added sequentially.



4.3.3 Scale

This function is for changing the scale of the graph displayed currently for its vertical and horizontal axes.

< Procedures >

< Step 1 >

Click a "Scale change button" on the graph display window.


< Step 2>

Change values of the graph range for horizontal axis displayed and press the [OK] button.

Scale	
Horizontal 10.00 < <==> 2000.00 < Hz All region V Log Symmetry Auto Range Fix 7.64 < oct Display zoom 2 In Out	OK Cancel Grid Normal
Vertical Image Image<	

4.3.3.1 3D graph scale change

In 3D graphs, the scale of depth axis can be changed.

The setup items are as shown below.

Display first No.*:	First No. of displayed data can be set up.
Display last No.*:	Last No. of displayed data can be set up.
Hidden line display:	Lines hidden backward (hidden lines) can be displayed.
Reverse direction display*:	Data with large number can be placed foremost.
Ratio of horizontal axis:	The horizontal axis ratio of graph display area can be set up.
Ratio of vertical axis:	The vertical axis ratio of graph display area can be set up.

* Setup is not allowed by "Waterfall graph (scroll display)".

	Displayed data	a range can be set up.
Scale Horizontal axis/Vertical axis Depth axis		OK Cancel
Ch1 Ch4 Displaying hidden lines Reverse axis direction Specifying graph display area Ratio of horizontal axis 80.0 🚔 %		Grid None 👻
Ratio of vertical axis 80.0 🚔 %		

4.3.4 Cursor Display

This function is for displaying of hairline cursors in a specified graph currently displayed.

< Procedures >

< Step 1 >

Right-click the mouse button on the graph or click the "cursor button" to display the cursor in the graph.



< Step 2 >

Use the dialog of 'Graph cursor'. The cursor in the graph is shifted by the operation.

Name of data	Unit	Cursor 1	Cursor 2	Delta	
Frequency Response	Hz m/s²	141.0 10.0083			
().0 Hz		•		2	000
0.0 Hz Double cursor	Oursor 1	Cursor 2	141.0		000

4.3.4.1 Double cursor display

- < Operating procedure >
- < Step 1 >

Check double cursor in the graph cursor dialog box.

Cursor 2 is enabled.



< Step 2 >

Select and operate cursor 2.



If cursor 1 is selected, you can operate cursor 1.

The graph cursor dialog box displays the difference between cursor 1 and cursor 2.

4.3.4.2 Peak search

- < Operating procedure >
- < Step 1 >

Press the down arrow at the lower right corner of the graph cursor dialog box.

ridine of doto	Unit	Cursor 1	Cursor 2	Delta	
Frequency Monitor	Hz m/s ²	75.40 27.9943			
(Þ
0 Hz				2	0.000
				100 C	

< Step 2 >

The peak search setting window opens.

Graph cursor					×
Name of data	Unit	Cursor 1	Cursor 2	Delta	
Frequency Monitor	Hz m/s ²	75.40 27.9943			
•					+
5.0 Hz				2	0.000
Double cursor	Oursor 1	Cursor 2	75.40	+ Hz	
Peak	max 👻	Condition		ax Ber	nister
	(20113001111			

Press the following buttons to search the peak and move the cursor:

- [>>] : Searches the peak in the horizontal axis plus direction.
- [Min] : Searches the minimum value.
- [Max] : Searches the maximum value.

[Condition] : Sets the conditions of peak determination.

- Peak is searched within the displayed graph scale range.
- The peak to search can be selected from 'Max./ Min./Both'.
- Click the data displayed in the list to select the data to search.

4.3.4.3 Registration of cursor data

- < Operating procedure >
- < Step 1 >

Press the [Register] button in the peak search setting window.

raph cursor					— ×
Name of data	Unit	Cursor 1	Cursor 2	Delta	
Frequency Monitor	Hz m/s²	100.0 1.8632			
∢ 0.0 Hz					1000.0
Double cura	sor 💿 Cursor '	1 🔘 Cursor 2	100.00	▲ ▼ Hz	
Peak Min << Loo	cal max 🔻	Condition	>> Max	Register	

< Step 2 >

The cursor data selected when the [Register] button has been pressed will be saved in the list.

raph cursor					×
Name of data	Unit	Cursor 1	Cursor 2	Delta	
Frequency Monitor	Hz m/s²	270.0 5.5318			
).0 Hz					1000.0
Double curso	и 🧿 Cursor 1 (🔵 Cursor 2	270.00	▲ ▼ Hz	
Peak Min << Loca	il max 👻 🗌 Co	ondition	>> Max	Register	
Frequency[Hz]	Monitor[m/s2]				Mark

Press the [CSV File] button to save the cursor data displayed in the list in a CSV file.

<Step3>

Press the [Mark] button to mark the cursor data displayed in the list.

Name of data	Unit	Cursor 1	Cursor 2	Delta	
Frequency Monitor	Hz m/s²	270.0 5.5318			
1					4
J.U HZ					1000.0
Double cursor	🖲 Cursor 1 🦲) Cursor 2	270.00	▲ Hz	
Peak Min ≤< Local	max ▼ <u>C</u> or	ndition	<u>>></u> Ma <u>x</u>	_ <u>R</u> egister	
Frequency[Hz]	Monitor[m/s2]				
100.0 66.50 176.0 270.0	1.8632 9.2083 4.3307 5.5318				<u>C</u> SV file Delete
					All detele



4.3.4.4 Cursor display in 3D graph

Although the operation procedures are similar to those of normal graph, depth data needs to

be selected.					
Graph cursor					×
Name of data	Unit	Cursor 1	Cursor 2	Delta	
Frequency Monitor Channel name	Hz m/s²	100.0 10.0021 Ch1			
<					4
Depth data	1	🔹 th			2000.0
🔲 Double cu	rsor 💿 Curs	or 1 🔘 Cursor 2	100.00	▲ ▼ Hz	

4.3.5 Graph Change

The graph displayed in the current display is changed.

- < Procedures >
- < Step 1 >

Click a "Graph change button" on the graph display window.



< Step 2 >

Select one item each in the list of Graph type and another descriptions and press the [OK] button.

Graph type selection			
Control reference/respon Monitor Drive Transmissibility [Respons Transmissibility [Monitor] Monitor Distortion	se]		OK Cancel
Display type	Additional display	Display unit	
Reference	Alarm tolerance	Acc.	
Response	Abort tolerance	🔿 Vel.	
Resp./Ref.	Limit control execution ratio	🔘 Disp.	

4.3.6 Peak Mark

Peaks and valleys in the graph data currently displayed can be marked.

< Procedures >

< Step 1 >

Click the icon of "Peak Mark".



Peaks are marked with rounds, and valleys are marked with squares from the higher order. The values appear in the legend window.

As for the peak detecting conditions, maximum number of marks, changing of display/nondisplay of value Q, refer to "4.3.7 Graph Color Setting".

Note) This button is invalid during excitation.

Marks displayed before excitation are deleted when excitation starts.

4.3.7 Graph Color Setting

This function is for changing the setting of graph freely to be displayed.

- < Procedures >
- < Step 1 >

Select "Option" in the menu bar and click the "Graph color setting".

~(W	Option(O) Help(H)	
	Set up(A)	
🕰 【	Graph setting(G)	
1 iew	Environment setting(E)	Stop
Ela	AVD calculation(C)	Ala
	Web monitor setting(W)	
	E-mail sending function setting(M)	
	Report generator setting(R)	
	ECO mode maintenance settings(I)	
	High speed camera communication settings(H)	
	Select language(S)	

4.3.7.1 Change Graph Color

Select items to be changed on the tab of "Graph color", and change the settings of line types, marks, and colors.

Selection of output Display	•	Default Color Black White	Cance
Construction Information	Data line		
Window background	O Data 1	🔘 Data 9	
Graph background	💿 Data 2 🔛	💮 Data 10	
🔘 Graph frame	🔿 Data 3 📈	🔘 Data 11	
Characters	🔘 Data 4	🔿 Data 12	
🗇 Grid	🔘 Data 5	🔿 Data 13	
Cursor	🗇 Data 6	🗇 Data 14	
C Legend background	🗇 Data 7	🗇 Data 15	
C Legend characters	🔘 Data 8	💿 Data 16	
	Aux. data		
Color setting	Phase	Alarm	
	C Abort	C Limit	
	Line	Mark	
	Style	Style O -	
	Thickness Normal	•	
	Color settin	a (L) Color setting (M)	

Note) The setting of 'Graph color setting' is not influenced to the setting of 'Print color setting'. Refer to 'Print color setting' in "4.4 Output to the Printer" about changing the color of a graph to be printed.

4.3.7.2 Change of Auxiliary Information

Change the settings of display/non-display of 'Test beginning/ending time' and peak mark on the tab of 'Aux. information' tab.

After completing necessary c	changing, press	the button	of [OK].
------------------------------	-----------------	------------	----------

aph color Aux. Information	
] Display test beginning/ending time.(D)	Cancel
Peak mark Threshold of peak detection Linear 5.0 🚔 %	Whether beginning/ending time should be displayed in the legend window or not can be set.
Log 2.00 dB	
Display type Both Max. display number 5	
Display Q value.(Q)	Peak mark setting is available.
Adjust the legend width automatically	
	Whether automatic adjustment of legend length should be available or not can be set.
	Whether automatic adjustment of legend length should be available or not can be set.

4.3.7.2.1 Test Beginning/Ending Time

Whether test beginning/ending time should be displayed in the legend window or not can be set.

While a test is being executed, test beginning time is displayed when excitation is started, and test ending time is displayed when the excitation is ended.

This setting is valid for applications shown below.

SINE, RANDOM, SHOCK, RESONANCE DWELL, Multi-SWEEP SINE BMAC, Multi-RANDOM, Multi-SINE, BMAC with Torsion

Note) There may be some differences between the time displayed and that of the execution status and history.

4.3.7.2.2 Peak Mark

Setting relative to peak mark is available.

< Threshold of peak detection >

Threshold to judge peak/valley can be set up.

<Display type>

Select any object to be marked among the choices of 'Maximum value/Minimum value/both'.

<Max. display number>

Maximum number of marking can be set up. (from 1 to 10) If detected peaks and valleys are less than it, only the detected items are marked.

<Search in the scale range>

Whether peaks and valleys should be detected in the scale range currently displayed or in all the data can be set up.

<Display Q value>

Whether Q value should be displayed with the peak value in the remark window or not can be set up.

Note) This function is valid only in transmissibility graph.

Q value is calculated by using the formula below.



4.3.7.2.3 Legend Width

Whether automatic adjustment of legend length should be available or not can be set.

4.3.8 Overlaid graph of two types of data

It is possible to overlay two types of graphs on one graph.

By using this function, data of different physical quantities (acceleration, force, etc.) can be overlaid.

< Procedures >

The following is the explanation of display procedures taking the overlaid graph of acceleration reference/response data and force monitor data in SINE as an Example.

<Step 1>

Select the menu of [Window] – [Overlaid graph].



<Step 2>

Press the [Select(1)] button and select [Resp./Ref.].

Overlaid graph	selection			× •
Graph type selection Control reference/response Monitor Drive Transmissibility [Response] Transmissibility [Monitor] Monitor Distortion			OK Cancel	Select(1)
Display type	Additional display	Display unit		Cancel
 Reference 	Alarm tolerance	Acc.		
 Response 	Abort tolerance	🔿 Vel.		
Resp./Ref.	Limit control execution ratio	O Disp.		

<Step 3>

Press the [Select(2)] button and select [Monitor] and the input channel of force.

Graph type selection	×	Select(1)
Control reference/response	OK	Select(1)
Transmissibility [Response] Transmissibility [Monitor] Monitor Distortion	Cancel	Select(2)
Display channel unit	Additional display concerning to Reference/Response	Cancel
	Reference	
Ch4	Reference alarm tolerance	
	Reference abort tolerance	
	Additional display concerning to monitoring	
	Monitoring	
	Monitoring alarm tolerance	
All channels	Monitoring abort tolerance	
Overlaid	Additional display concerning to	

<Step 4>

Press the [OK] button and close this screen.

Overlaid graph se	lection		×
Graph type1	Control reference/response		Select(1)
Graph type2	Monitor		Select(2)
		ок	Cancel
			Ë

<Step 5>

The overlaid graph of acceleration reference/response data and force monitor data is displayed.



4.4 Output to the Printer

4.4.1 Print

In K2+ Application, Test Definition, Graph and Log are printed out mainly by using the function of print executed by selecting "File" – "Print" in the menu bar.

The items to be printed out are available to select by clicking on it.

- < Procedures >
- < Step 1 >

Select "File" in the menu bar and click "Print" among the items.



< Step 2 >

Select printer and input the setting of 'Margin Setting' and 'Header/Footer' and press [OK].

Header and footer are printed inside except the margin area. If the number of characters displayed in header and footer are too large and they cannot be displayed completely. In this case, increase the height.

When 'Print per Graph' is checked and two or more graphs are printed, one graph per each page is printed. The scale of the printed graph is the same as the scale of the displayed graph.

Print	? 💌		
Printer			
Name of printer (N) KONICA MINOLTA 423SeriesPS	Property		
Status Ready			
Kind KONICA MINOLTA 423SeriesPS			
Place IP_192.168.111.139			
Common			
Printing area	- Number of copies		
All(A)	Number of copies (C): 1 🚖		
Specify a page (G) From page (F)	Sort each copy (0)		
to page (T)			
Selected part (S) 11 2 2 3			
Margin			
Left 15 mm Right 15 mm Top 5	mm Bottom 5 mm		
Header/Footer	Graph		
✓ Print the header (H) Height 10 mm	🔲 Print per Graph		
✓ Print the footer (E) Height 10 mm			
	OK Cancel		

4.4.2 Printer Setting

This item is for defining of margin setting, setting of footer/header and date printing for the printer.

- < Procedures >
- < Step 1 >

Select "File" in the menu bar and click "Printer setting" among the items.

	🚱 New definition - K2/Sine		
~~	File(F) Test definition(T) Operation(P) Edit(E) View(V)	Window(V	V) Opt
· Â	New(N) Sweep test simplified definition(Z)	Ctrl+N	W
	Open(O)	Ctrl+O	Ren
	Save(S)	Ctrl+S	Thep
	Save as(A)		
	Another Excitation System Information loading(F)		
	New Input Environment Information loading(I)		
	New Input Environment Information saving(K)		
	Save graph data(M)		
	Print(P)	Ctrl+P	
	Preview(V)		
	Printer setting(R)		
***	Page setup(U)		
	Report generation(T)		
2	1 TestSweep.swp2		
	Exit(X)		equenc
			10.00
	Delete 2	1	20.00
			101101

< Step 2 >

Select the printer to be used, setup, paper size, and Orientation, and press [OK] button.

Print Setup		×
Printer		
Name:	KONICA MINOLTA 423SeriesPS	▼ Properties
Status:	Ready	
Type:	KONICA MINOLTA 423SeriesPS	
Where:	IP_192.168.111.139_(1)	
Comment	:	
Paper		Orientation
Size:	A4 🔹	Portrait
Source:	Auto	\mathbf{A} $_{\bigcirc$ Landscape
Network.		OK Cancel

4.4.3 Page setup

Print margin can be set up.

- < Procedures >
- < Step 1 >

Select "File" in the menu bar and click "Page setup" among the items.

Opt
W
Rep
uenc
.00
00

< Step 2 >

Input the setting of 'Margin Setting' and 'Header/Footer' and press [OK].

Header and footer are printed inside except the margin area. If the number of characters displayed in header and footer are too large and they cannot be displayed completely. In this case, increase the height.

When 'Print per Graph' is checked and two or more graphs are printed, one graph per each page is printed. The scale of the printed graph is the same as the scale of the displayed graph.

Page Setup	X
Left 15 mm Right 15 mm Top	5 mm Bottom 5 mm
Header/Footer	Graph
✓ Print the footer (E) Height 10 mm	OK Cancel

4.4.4 Print Color Setting

This item is for setting of the graph display type of data line, color and mark at printing.

- < Procedures >
- < Step 1 >

Select "Option" in the menu bar and click "Graph setting" among the items.



< Step 2 >

Select "Printer" from "Selection of output" in the graph color setting tab.

Graph setting			×
Graph color Aux information			ΠΚ
Colorian of extend Directory of			
Construction Information	Dista line	Default Color Black White	Lancel
Urindow background			
			٠́Č
Graph background			H
Graph frame	🔘 Data 3 🚽 🔶	🔘 Data 11	$\mathbf{\nabla}$
Characters	🔘 Data 4 🛛 🔼	🔿 Data 12	
🔘 Grid	🔘 Data 5 🚽 🗸	🔿 Data 13	
Cursor	🔘 Data 6	🔘 Data 14	
Legend background	🔿 Data 7	🔘 Data 15	
Legend characters	🔘 Data 8	🔿 Data 16	
	Aux. data		
Color setting	🔘 Phase	🔿 Alarm	
	C Abort	C Limit	
	Line	Mark	
	Style	→ Style O →	
	Thickness Normal	-	
	Color on the day		
Pofer (P) Periote		Loior setting (M)	

< Step 3 >

Select the data line and the color etc..

Then press [OK] to complete the setting.

Steph setting Selection of output inter Construction Information O data ine O d				Â,
Braph color Aux. information Default Color Black White Construction Information Data line Data 1 Obta 2 Construction Information Data 10 Cancel Window background O Data 1 O Data 3 O Data 10 Cancel Cancel © Graph background O Data 1 O Data 10 Cancel Cancel Cancel © Graph background O Data 1 O Data 10 Cancel Cancel Cancel © Graph background O Data 2 O Data 10 Cancel Cancel Cancel © Graph background O Data 3 O Data 10 Cancel Cancel Cancel © Graph background O Data 3 O Data 11 Cancel Cancel Cancel © Cursor O Data 5 O Data 13 Cancel Cancel Cancel Cancel Color setting. O Data 6 O Data 15 Cancel Cancel Cancel Cancel Line Vink data O Data 16 Cancel Cancel Cancel Cancel Line Vink data Cancel Cancel Cancel	araph setting			
Biack information Selection of output Construction Information				
Selection of output Construction Information Data line O Data line D Data line D Data line <	Graph color Aux. information			
Construction Information Window background Graph background Data 1 Graph background Data 2 Data 1 Data 2 Data 10 Data 10 Data 2 Data 10 Data 2 Data 10 Data 11 Data 2 Data 12 Data 14 Data 5 Data 6 Data 15 Data 16 Data 16 Aux. data Phase Abot Line Style Thickness Normal Color setting (L),	Selection of output Printer	<u>·</u>	Default Color Black White	Cancel
Window background Graph background O Data 1 Graph frame Data 2 Data 3 Characters Data 4 Data 5 Cursor Data 6 Data 7 Data 16 Color setting Line Line Line Line Color setting (L) Color setting (M)	Construction Information	Data line		
Graph background Image: Graph frame Image: Gr	Window background	🖲 Data 1 🗕 🔶	🔘 Data 9 🛛 🔶	
 Graph frame Data 3 Data 11 Characters Data 4 Data 12 Data 13 Cursor Data 5 Data 6 Data 14 Data 15 Data 16 Data 8 Data 16 Abort Limit Color setting (L), Mark Style Thickness Normal Color setting (M),	Graph background	🔘 Data 2 🔤 🛁	🔘 Data 10 🔀	
○ Characters ○ Grid ○ Cursor ○ Data 5 ○ Data 5 ○ Data 6 ○ Data 13 ○ Data 13 ○ Data 14 ○ Data 7 ○ Data 8 ○ Data 15 ○ Data 8 ○ Data 16 Aux. data ○ Phase ○ Abort □ Limit Color setting Mark Style Thickness Nomal Color setting (L)	Graph frame	🗇 Data 3 🛛 🔶	💿 Data 11 🛛 🔶	
Grid Cursor Legend background Data 5 Data 6 Data 14 Data 14 Data 15 Data 15 Data 16 Aux. data Phase Abort Limit Style Thickness Normal Color setting (L)	Characters	🔿 Data 4 🔤 🖂	🔘 Data 12 🔄	
Cursor Legend background Legend characters Data 7 Data 7 Data 15 Data 8 Data 16 Aux. data Phase Abot Lime Style Thickness Normal Color setting (M)	🔘 Grid	○ Data 5		
Legend background Legend characters Data 7 Data 8 Data 16 Aux. data Phase Abort Limit Style Thickness Normal Color setting (L) Color setting (M)	Cursor	🗇 Data 6		
Legend characters O Data 8 Color setting Akarm O Data 16 Aux. data Phase Abort Limit Lime Style Thickness Normal Color setting (L) Color setting (M)	Legend background	🗇 Data 7		
Color setting Aux. data Phase Abort Limit Style Thickness Normal Color setting (L) Color setting (M)	Legend characters	🗇 Data 8	Data 16	
Color setting Phase Abort Line Line Style Thickness Normal Color setting (L) Color setting (M)		Aux. data		
Abort Line Style Thickness Normal Color setting (L) Color setting (M)	Color setting	© Phase	O Alarm	
Line Mark Style Thickness Normal Color setting (L) Refer (B) Register		C Abort	C Limit	
Style Style Thickness Normal Color setting (L) Color setting (M)		Line	Mark	
Thickness Normal Color setting (L) Color setting (M)		Style	── ▼ Style ○ ▼	
Color setting (L) Color setting (M)		Thickness Normal		
Refer (B) Register				
	Refer (R) Register	Loior setting	Lolor setting (M)	
	neier (b) Hegister			

Note) Printer may not work correctly when the setting of 'Printer type' is not set correctly.

4.5 File Conversion

4.5.1 File conversion to CSV

This function is for converting a data file of K2+ file format to that of CSV file format.

- < Procedures >
- < Step 1>

Click a [Save Data] button on the graph display window.



< Step 2>

Show the Data Save window and Input a file name of CSV and press [Save].

😳 Save CSV file					×
Save in:	My Documer	nts 🔹	G 👌 📂 🛄-		
Recent Places Desktop Libraries Computer	Name DATA01.cs TestSweep2	v 2.csv	Date modified 7/18/2013 10:51 AM 7/19/2013 2:20 PM	Type CSV File CSV File	Size 88 1
Network	File name: Save as type:	CSV file(*.csv)	m	•	<u>Save</u> Cancel
	Header		*	Ë	*
	Comment			Header	nformation

Conversion of SINE Reference/Response Data (with Tolerance)

1st. column 2nd. column

2nd.	li

1st. line	Frequency[Hz]	Response[unit]	Reference[uni]	Abort upper limi[uni])	
2nd. line	*** ***,	***.***,	*** **	*** **	
	*** ***,	*** ***,	*** **	*** **	
	*** ***,	*** ***,	***.**,	***.**	
	:	:	:	:	:
	*** ***,	***.***,	*** ***,	*** **	

- Fixed characters are written in Italic.
- Data name of graph is substituted for a data name.
- Unit of graph is substituted for a unit.
- Frequency data is substituted in the 1st. column.
- Each data is substituted from the 2nd. column.

	1st. column	2nd. column	3rd. column		
1st. line	Frequency[Hz]	Data name 1 <i>[unit]</i>	Data name 2[unit]	Data name 3[unit]	
2nd. line	*** ***	*** ***	*** **	*** **	
	*** ***,	*** ***	*** **	*** **	
	*** ***,	*** ***	*** **	***.**,	
	:	:	:	:	:
	*** ***	*** ***	*** ***	*** **	

Conversion of RANDOM Spectrum Data

- Fixed characters are written in Italic.
- Data name of graph is substituted for a data name.
- Unit of graph is substituted for a unit.
- Frequency data is substituted in the 1st. column.
- Spectrum data is substituted from the 2nd column.

Conversion of SHOCK Waveform Data

	1st. column	2nd. column	3rd. column		
1st. line	Time[ms]	Data name 1 <i>[unit]</i>	Data name 2[unit]	Data name 3[unit]	
2nd. line	*** ***	*** ***	*** **	*** **	
	*** ***,	*** ***	*** **	*** **	
	.,	*** ***,	*** ** ,	*** **,	
	:	:	:	:	:
	*** ***,	*** ***,	*** ***,	***.**,	

• Fixed characters are written in Italic.

- Data name of graph is substituted for a data name.
- Unit of graph is substituted for a unit.
- Time data is substituted in the 1st. column.
- Each data is substituted from the 2nd column.

4.5.2 Graph display on Excel

This function is for displaying graphs on Excel by converting the data file in K2+ file format to in the excel file format.

This function requires Microsoft® Excel software installed.

Note) This program supports only for Microsoft® Excel 2010, Microsoft® Excel 2013, Microsoft® Excel 2016 and Microsoft® Excel 2019.

- < Procedures >
- < Step 1 >

Select a graph to be converted and displayed on Excel.

Press the button of [Output the graph to Excel] in the graph display dialog of K2+.



Excel software is started up to display the selected graph in the excel format.

4.6 Selecting languages (option)

This function is optional.

This function selects the language for K2+ application display.

The language used for saved data files cannot be switched.

- * 'Japanese, English, Chinese, Russian or German' can be selected (as of October 29, 2015).
 Response statuses of respective K2+ applications are varied.
- < Operating procedure >
- < Step 1 >

Select "Option" from the menu bar and click "Select Language".

	low(W)	Option(O) Help(H)	_
	2	Set up(A) Graph color setting(G)	
	eview	Environment setting(E)	Stop
		AVD calculation(C)	Alarm
**		Web monitor setting(W) E-mail sending function setting(M) Report generator setting(R)	
		ECO mode maintenance setting(I)	
		High speed camera communication setting(H)	
		Select Language(S)	

< Step 2 >

Select a language, and then press the [OK] button.

×
ОК
Cancel

The following message appears. The current language will be switched on application restarting.



4.7 Test Definition File

It describes that each data saved in Test Definition file (Live Data in Operation, Excitation system information, Input environment information).

4.7.1 Saving Live Data in Operation

The state at the test abort (completed), that is, a data necessary for the test is to be recorded by saving its Test Definition file of the state at excitation completed.

Press the icon of [Save] in the state at excitation completed. A dialog box as below appears if there is a data to be recorded to a test in the state at excitation completed. Available items in this dialog vary according to the reason or condition at excitation completed.

😨 New def	finition	- K2/Sine					
File(<u>F</u>) Te	est defir	nition(<u>T</u>) Oper	ration(<u>P</u>)	Edit(<u>E</u>)	View(⊻)	Wind	ow(<u>W</u>)
New		Open	Test save	Data sav	ve Print	Pr	eview
Frequer	ncy	Reference	Resp	ionse	Drive		Elap
200	0.00	1.0	C	.9966		3.0	
	Hz	т/s² 0-р	n	n/s² 0-p	mV	0-р	
	Refe	rence/Respo	nse C)peratio	on status		
	Cont	rol reference/r	esponse				-
Next		🗟 🛛 🖾 🖓 🚽	, 🖀 👪	🔛	M 🗠 [

Example Display at Excitation Completed

re option		x
Reflect the graph display condition to the definiti	ion. OK	
Save the continuing excitation data to the defini	ition] Cancel	
Save the continuing excitation data to the defini	ition] Cancel	

Save option

4.7.2 Deleting of Testing Operation Relational Data

You have the merit and the demerit as below at acquiring and saving the testing operation relational data in a Test Definition file.

[Merit]

- The state at the test completion is to be checked again after the test completion.
- Excitation operation is to be restarted from the state at excitation completed.

[Demerit]

• Test Definition contents cannot be changed until the Live Data in Operation is deleted.

To delete the testing operation relational data, follow the steps below.

< Procedures >

< Step 1 >

Press the button of [Delete] by selecting Relational Data.



< Step 2 >

Press [Yes] when a dialog of message for assuring appears.



4.7.3 Another Excitation System Information loading

This item is for changing the excitation system information registered in Test Definition file to another.

< Procedures >

< Step 1 >

Select "File" in the menu bar and click "Another excitation system information loading" among the items.



<Step 2>

Select 'Excitation system information name' to be registered in Test Definition File and press [OK].

System1	ОК
System2	
System3	Cancel

< Step 3 >

The corrected server name and Excitation system information name are displayed. Press [Save] to overwrite the Test Definition file.

				Ö				
😨 C:\Users	\IMV\Docume	ents\TestSweep	2.swp2 - KZ	/Sine				
File(<u>F</u>) Te	est definition(<u>T</u>) Operation(P) Edit(<u>E</u>)	View(<u>V</u>)	Window(<u>W</u>)	Option(<u>O</u>) Help	(<u>H</u>)	
New	Simple O	Open Test sav	e Data sav	ye Print	Preview	Report Ope. st	tart Ope. end	
Frequer	ncy Refe Hz	erence Re	sponse	Drive mV	<mark>0-р</mark>			
	Test defini	<mark>tion</mark> Refere	nce					
	Test Defin	nition				_		
Next	S Test Defi S I/O M Excita S Fund Excita Excita	inition Informat Aodule Configu ation System Inf lamental/Contro ation system set	on ration ormation ol Conditi ting	Test type Exc. Syst Continuin Graph da	em Config. g exc. data ta	Sweep Single shaker Not existing Not existing		
Add	Swee Swee Input Resor Aux. Data	p reference t channel nance dwell output Save Condition		Module (Mod ((Configuration Iule ID 100 101	Module 4ch I/O modu 8ch Input mode	type le TYPE-2 ule TYPE-2	
Delete				Excitation Exc. S Ou	<u>i System En</u> System Info. Itput channe	vironment System2 I	dule ID	
OFF						1410	000	

4.7.4 Input Environment Information

Input environment information is used for simplifying of the input sensitivity setting for a sensor. When Input environment information is used for the setting, addition/correction of an input channel is also available during the test definition.

4.7.5 New Input Environment Information Loading

Input channel information is available to load newly from the input channel information registered in Environment setting.

< Procedures >

< Step 1 >

Select "File" from the menu bar and click "New Input environment information loading" among the items.

	😨 C:	\Users\IMV\Documen	ts\TestSweep2.s	wp2 - K2	2/Sine		
	File(f) Test definition(T)	Operation(P)	Edit(E)	View(V)	Window(W)
		New(N)				Ctrl+N	
		Sweep test simplified	definition(Z)				
		Open(0)				Ctrl+0	
\square		Save(S)				Ctrl+S	
		Save as(A)					
		Another Excitation Sys	stem Informatio	n loadin	g(F)		
	π	New Input Environme	nt Information I	loading(l)		
. * * /		New Input Environme	ent Information :	saving(K)		
۰ ۳		Save graph data(M)				-	
		Print(P)				Ctrl+P	
\mathbf{U}		Preview(V)					9
		Printer setting(R)					
		Page setup(U)					
		Report generation(T).				c	n
		1 TestSweep.swp2					
		Exit(X)					
		\sim			Excitatio	on System E	nv
	Del	ete			Exc.	System Info	4

< Step 2 >

Press [OK] by selecting an Input environment information to be used.



4.7.6 New Input Environment Information Saving

The setting of input environment used in Test Definition is available to be registered in Environment setting as Input channel information.

< Procedures >

< Step 1 >

Select "File" in the menu bar and click "New Input environment information saving" among the items.





Press [OK] by inputting the name of Input environment information.

nput3		
Input Environment Information name	Number of input channel	
Input1 Input2	12 2	

4.8 Contact I/O Information

4.8.1 Outline

It describes about the definition method of input/output signal configuration to the contact I/O port set to I/O Unit.

The contents of Contact I/O signal function is ordinary specified for each application program individually. However, in this system, the user can flexibly define the use/not use and the port configuration of contact I/O signals according to the specifications.

Definition of this item is not necessary to be defined when Contact I/O function is not used.

Contact I/O ports are set to the 50 pin connectors arranged on the backside panel of I/O Unit. Configuration of pin connectors is described as below;

Input terminal 8-bits, Output terminal 8-bits are available.

Additionally, terminals for A contact and B contact are also available for each output terminal.

25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	

	STOP+	O8A	O7A	06A	O5A	O4A	O3A	O2A	OlA	O8B	O7B	O6B	O5B	O4B	O3B	O2B	O1B	I8-	I7-	I6-	I5-	I4-	I3-	I2-	I1-
	STOP-	O8A	O7A	06A	O5A	O4A	O3A	O2A	OlA	O8B	O7B	O6B	O5B	O4B	O3B	O2B	O1B	I8+	I7+	I6+	I5+	I4+	I3+	I2+	I1+
-	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26

Configuration of signals for each I/O terminal depends on the user in this system. And it is to be defined by the procedures described as below.

4.8.2 Contact I/O setting

Contact I/O information is to be set in **Excitation system information** of Environment setting beforehand when an external equipment and K2+ system are always connected in a combined test.

You don't have to define the contact I/O information every time at generating a test when you use the function described in this clause.

- < Procedures >
- < Step 1 >

Select "Option" in the menu bar and click "Environment setting" among the items.



< Step 2 >

\$

Select an Excitation system information for setting of Contact I/O information and click the [Change] button.

Module ID	Module type		
000 001	4ch I/O module TYP 8ch Input module TY	E-2 PE-2	Cancel
			<u>R</u> enew
Excitation System System1 System2	em Information		-
Excitation System System2 System3	em Information		Add Change Delete
Excitation System System2 System3 Input Environm Input Environm	em Information	Number of input channel	Add Change Delete
< Step 3 >

Press the [Define] button of Contact I/O information.

Daine and and	Martin 0	00 -	ChiNe Chil			Delarity		0			ſ
Drive output	Module		CHNO. CHI			Foldiny (0.			L.
Initial output	voltage default v	/alue	30.0 🚔 m	Vm	s	Armature M	lass		× kg		
Rating Info	ormation										
Contro	frequency range	e is limiti	ed.								
	Check the	rate									C Other control q
	Rated Force		Acceleration			Velocity			Displacement		
		×	m/s²	•		m/s	•		mm 🗸		
		÷ 04	p 1000.0	*	0-р	1000.0	*	0-p	1000.0	p-p	
SINE			s 100.0	*	ms	0.30	*	0-р	10.0	p-p	
RANDOM		* m									

< Step 4 >

Operate the setting of Contact I/O and press [OK].

Teminal	Available Information	Polarity	Terminal	Available Information	
1	START	Positive	1	SIGOUT	
2	NOTUSE		2	TIMEUP HOLDOFE	
4	AUXIN2	Positive	4	HOLDOFF	
5	NOTUSE		5	HOLDOFF	
6	NOTUSE		6	HOLDOFF	
8	NOTUSE		8	HOLDOFF	
		\blacksquare			
Contact In	formation [Input contact 1]				<u>م</u> هج
Contact Ini Available I	formation [Input contact 1]		Available Ir	nformation	*
Contact Ini Available I	formation [Input contact 1]	-	Available Ir	nformation	
Contact Ini Available I Polarity	formation [Input contact 1] Information START	▼ Change(C)	Available Ir	nformation	Chan
Contact Ini Available I Polarity	formation [Input contact 1] Information START • + O -	- Change(<u>C</u>)	Available Ir	nformation	Chan

< Step 5 >

Press the [OK] button.

Excitation System	n Information nam	e Sj	ustern1									
Drive output Mo			stenn									OK
onro output int	odule 000	•	Ch No. Ch1		•	Polarity) +	© ·				Cancel
Initial output volt	age default value		30.0 🌻 m'	V ms		Armature M	ass		× kg			H
Rating Informat	tion											•
Control freq	quency range is lir	nited.										
E	Check the rate											C Other control quantities
R	lated Force		Acceleration			Velocity			Displaceme	nt		
	×		m/s ²	•		m/s	•		mm	٠		
SINE	(^) (¥	0-p	1000.0	•	0-р	1000.0	*	0-р	1000.0	•	p-p	
RANDOM		ms	100.0	×	ms	0.30	×	0-p	10.0	*	р-р	
sноск Г	A	0-р	300.0	•	0-р	0.30	•	0-p	10.0	•	p-p	
Contact I/O Infor	rmation Defin	ed	Define(<u>D</u>)		Chang	e(<u>A)</u> Ca	ncel(<u>B)</u>				

4.8.3 Contact I/O signal Setting

Input Part

Name	Order
NOTUSE	The specified terminal is not used.
RMTENB	This item is for setting of an allowance of remote control for a contact state
	before the initial measurement.
	Valid : one time only before the initial measurement
	Default : Remote control is always allowed.
SYSRDY	This item is for setting of Excitation system to be available to operate.
	Valid : in all the state of test operation mode
	Default : Excitation system is always available to operate.
START	This item is for starting of excitation, XFR measurement or data acquisition.
	Valid : in the state of waiting for operation start, for XFR measurement start
	or for data acquisition start
	Default : no order
STOP	This item is for stopping of excitation, XFR measurement or data
	acquisition.
	Valid : in the state of executing the operation, operating XFR measurement
	or acquiring the data
	Default : no order
PAUSE	This item is for pausing of the excitation at 'closed'.
	And this item is for canceling the paused state and continuing the excitation
	at 'opened'.
	Valid : the state in operation
	Default : no order
	Available software : SINE, RANDOM
DCAN	This item is for canceling all input data and stopping the renewal operation
	of control loop at 'closed'. (for this result, checking operation such as
	tolerance check are not executed.)
	And this item is for canceling the valid state of this item and restarting the
	loop renewal operation at 'opened'.
	Valid : the state in operation
	Default : no order
	Available software : RANDOM
UP	This item is for increasing of the excitation level for the specified value in
	Control Condition. (Note 1)
	Valid : in the state of waiting for operation start or executing the test
	operation
	Default : no order
	Available software : SINE, RANDOM
DOWN	This item is for decreasing of the excitation level for the specified value in
	Control Condition. (Note 1)
	Valid : in the state of waiting for operation start or executing the test
	operation
	Default : no order
	Available software : SINE, RANDOM

Name	Order
TRIG	This item is for setting of external trigger.
	Valid : in the state of waiting for external trigger ON
	Default : no order
	Available software : CAPTURE
NEXT	This item is for proceeding to the next step (each process divided at the point
	of a waiting state for the operator's order is called 'step').
	Valid : in the state of waiting for the order to proceed to the next step
	Default : no order
	Available software : SHOCK
RETRY	This item is for preparing of excitation restart/reacquisition.
	Valid : in the state of excitation finished.
	Default : no order
NXLOOP	This item is for renewing the drive data.
	Valid : in the state of excitation finished.
	Default : no order
	Available software : SHOCK
EXIT	This item is for exiting from test operation mode.
	Valid : in the state of test operation mode except for in operation
	Default : no order
XFRRNW	This item is for renewing the XFR data.
	Valid : in the state of excitation finished.
	Default : no order
	Available software : SHOCK
AUXIN1	This item is valid only when the application program defines signal
	specification.
	SINE : Sweep reverse (valid only in Sweep Test)
	RANDOM : Sweep reverse (valid in SOR, ROR)
AUXIN2	Auxiliary output 2 : the same as in the above $C_{1} = C_{1} + C_{2} = C_{1}$
	SINE : Fixed sweep (Spot) / Cancel
	(valid only in Sweep Test, Spot Test).
	RANDOM : Sweep reverse / Cancel (valid in SOR, ROR)
AUXIN3	SDUE - Shift to the next exet (selid only in Spot Test)
	SINE : Shift to the next spot (valid only in Spot Test)
AUAIN4	SINE : This item is for increasing of the excitation frequency for the
	SINE : This item is for increasing of the excitation frequency for the
	(Note 2)
	Auxiliary output 4 : the same as in the above
AOAINS	SINE : This item is for decreasing of the excitation frequency for the
	specified value in Operation Setting (valid only in Manual Test)
	(Note 2)
AUXIN6	Auxiliary output 6 : the same as in the above
11011110	SINE : Skipping to the beginning of the next sween / Skipping to the first
	spot
	(Valid only in Sween Test, Spot Test).
AUXIN7	Auxiliary output 7 : the same as in the above

Name	Order
AUXIN8	Auxiliary output 8 : the same as in the above
AUXIN9	Auxiliary output 9 : the same as in the above
AUXIN10	Auxiliary output 10 : the same as in the above
AUXIN11	Auxiliary output 11 : the same as in the above
AUXIN12	Auxiliary output 12 : the same as in the above
AUXIN13	Auxiliary output 13 : the same as in the above
AUXIN14	Auxiliary output 14 : the same as in the above
AUXIN15	Auxiliary output 15 : the same as in the above
AUXIN16	Auxiliary output 16 : the same as in the above

Name	Order
Emergency stop	This item is for operating of emergency stop. The mute function of D/A
	converter decreases the drive output in hardware.

Note 1) Order signal must be a pulse keeping up more than about 500ms.

Excitation level is increased/decreased for the level specified in the application program by a single pulse.

Pulses can be outputted continuously with having an interval of 500ms between each pulse.

Note 2) Order signal must be a pulse keeping up more than about 500ms.

Excitation frequency is increased/decreased for the level specified in the application program by a single pulse.

Pulses can be outputted continuously with having an interval of 500ms between each pulse.

- Note 3) When the same input contact signal is set to multiple input terminals, the operation is as follows.
 - AND condition (When all input contact signals are ON, the order is to be valid) RMTENB, SYSRDY
 - OR condition (When one of input contact signals is ON, the order is to be valid) Contact input signal other than the listed above

Output Part

Name	Order
HOLDOFF	The specified terminal is not used.
HOLDON	The system is in Test Operation mode.
WSTART	The system is in the state of waiting for excitation start, for XFR
	measurement start or for acquisition start.
WTRIG	The loop is to be 'closed' in the waiting state for the external trigger.
WNEXT	This system is in the state of waiting for proceeding to the next step (each
	process divided at the point of a waiting state for the operator's order is
	called 'step').
	Available software : SHOCK
INMEAS	The system is in XFR measurement.
	(Initial measurement is not included.)
	Available software : SHOCK
INOPE	The system is in test operation or in data acquisition.
	(Including the state in pause. However, the state in XFR measurement is
	not included.)
SIGOUT	The system is outputting the drive signal.
	(Including the state in XFR measurement)
INPAUSE	The system is in pause.
EXC0DB	The system is operating the excitation at 0dB of excitation level.
TIMEUP	Test operation is completed when the specified test time is passed.
	(Finished normally) (This signal is ON for 1 second)
FINISHED	The system is in the state of excitation completion. (Including abort)
ABORTED	The excitation is stopped by abort function.
ALARM	The system is in the state of alarm detected.
	Available software : SINE, RANDOM
CHKERR	The excitation is stopped according to the result of Tolerance check as
	'NG'.
LEVEL CHANGE	Excitation level is changed. (This signal is ON for 1 second)
	Available software : RANDOM
AUXOUT1	This item is valid only when the application program defines signal
	specification.
AUXOUT2	Auxiliary output 2 : the same as in the above
AUXOUT3	Auxiliary output 3 : the same as in the above
AUXOUT4	Auxiliary output 4 : the same as in the above
AUXOUT5	Auxiliary output 5 : the same as in the above
AUXOUT6	Auxiliary output 6 : the same as in the above
	SHOCK, BMAC : The contact output signal synchronized with contact input
	signal ' SYSRDY'. Used in driving simulator system.
AUXOUT"/	Auxiliary output / : the same as in the above
AUXOUT8	Auxiliary output 8 : the same as in the above
AUXOUT9	Auxiliary output 9 : the same as in the above

Name	Order
AUXOUT10	Auxiliary output 10 : the same as in the above
AUXOUT11	Auxiliary output 11 : the same as in the above
AUXOUT12	Auxiliary output 12 : the same as in the above
AUXOUT13	Auxiliary output 13 : the same as in the above
AUXOUT14	Auxiliary output 14 : the same as in the above
AUXOUT15	Auxiliary output 15 : the same as in the above
AUXOUT16	Auxiliary output 16 : the same as in the above

4.9 IT Function

4.9.1 Web Monitor

The function of Web Monitor is for monitoring the test execution status of the K2+ through the PC connected to a LAN.

Any special software are not necessary to be installed; the display data of the $K2^{+*}$ is directly saved in a file as HTML format, and the test status can be checked by using a popular browser, such as Microsoft® Internet Explorer, from any PCs on the LAN.

Web Monitor is only for monitoring the test status. Additional client option is necessary to operate the remote control that is used to execute other operations, such as Test Stop or Test Start, from a distant place.

LAN environment is required to use this function.

*) To be exact, the display data of the PC on which the client program of the K2+ is running is saved in a file as HTML format periodically in the disk of a specified PC. Note that any of the current display data is saved as HTML format when other applications than the K2+ are executed on the PC simultaneously with the client program of the K2+

< Procedure (to set Web Monitor) >

<Step 1>

Select "Option" on the Menu Bar, and click the item of "Web Monitor setting".



<Step 2>

Check the check box of [Assert Web monitor] to be activated. And, set the necessary items. Please ask to the administrator of Net Work about the setting if it is necessary.

	g	
Assert Web mor	itor (HTML file generating) (<u>H</u>)	OK
HTML file path n	ame C:\Users\IMV\Documents\K2Test.html	
►HTML file update	Eath name change interval 0:00:10 to update the display image	
Add auto-upda	ting function to HTML(<u>A)</u> pdating interval 0:01:00 to reload the HTML	
When and aut 'Add the 'Auto-	he display of a browser is needed to be renewed periodically omatically on the PC for monitoring, check the check box of a auto-updating function to HTML' and specify the value of updating interval'.	
	Add the auto-updating function to HTML' is not checked to be	
When activate not ren change	ewed. The displayed contents cannot be changed as long as it is d by manual.	
When activate not ren change This item is for sp	ewed. The displayed contents cannot be changed as long as it is d by manual.	

< Procedure (monitoring in test operation) >

HTML file generated by the K2+ is opened by using a browser in the PC on the LAN. The example display as below is in the case of using Microsoft® Internet Explorer.



4.9.2 E-Mail Sending Function

E-Mail Sending Function is for informing stop/completion of the excitation. When the excitation is stopped or completed, the system sends the event of test stop to the specified mail address by E-Mail.

For example ; in the case that an operator started the excitation in the morning and left the laboratory. In the evening, the operator went back to check the state of the excitation. However, the excitation had stopped after 5 minutes from the excitation start because the pickup happened to be dislocated. Such an accident in operation can be acknowledged by E-Mail Sending Function. The operator can be saved from wasting of time and an efficient operation can be realized.

Also, E-Mails can be sent to the address of cellular phones.

LAN and the environment for sending E-Mails (Mail Server, Mail Address, Mailing Software) are necessary to use this function.

< Procedure (to set E-Mail Sending Function) >

<Step 1>

Select "Option" from the Menu Bar, and click the item of "E-mail Sending Function setting".

	(Intion(O)) Help(H)	
view	Set up(A) Graph color setting(G) Environment setting(E) AVD calculation(C) Web monitor setting(W)	Stop
	E-mail sending function setting(M)	
	Report generator setting(R) ECO mode maintenance setting(I) High speed camera communication setting(H) Select Language(S)	

<Step2>

Check the check box of 'Assert E- mail sending function(sending a e-mail)'.

And set the necessary items.

In initial setting, the outgoing mail server setting window automatically opens.

E-mail sending function setting		×
E-mail Address	[sending at the end of test][S]	Detailed(<u>T</u>)
Receivers Name	E-mail Address	
Name	E-mail Address	Add(<u>A</u>) Change(<u>C</u>) Delete(<u>D</u>)
	OK	Cancel

<Step3>

Set the outgoing mail server.

Please ask to the administrator of Net Work about the setting of sending mails if it is necessary.

E-mail sending function detail setting
Outgoing mail server (SMTP)
Port number 25 🚔 Use Defaults(D)
Type of encrypted connection Not use
Disable SSL certificate validation
Outgoing mail server (SMTP) requires authentication(M)
Log on using following account and password Type of mail server authentication
Contraction of the contractio
Incoming mail server (POP3)
Port number 110 Use Defaults(E)
Authentication using APOP(<u>A</u>)
Use the incoming mail server settings
Logon Information
Account name
Password
OK Cancel

<Step4>

Set the mail sending information.

								Set the	e outgoir	ng mail	server.			ר
	Tł	nis it	tem is	for	specify	ing the	title of	`E-Mail	to be set	nt.				
				This	item is	s for spe	ecifyin	g the ma	ail addre	ss of th	e sender	·.		
				Г	Salaat	to cond	Imail	nly wh	on tost is	finishs	d in any	or stat	116	
				L	Select	to send		only who		misne		or stati	us.	
E-m	nail sei	ndin	g func	tion s	etting									×
	1 4 4 4 4		-	din a fi	motion (c	andina at	the end	of tooth(C)	ł	Only when				
	E ese	31 E - 11	han seri	unyn	sender	a a a a a a a a a a a a a a a a a a a	vine eriu	or test <u>jio</u> j		Uniy wrie	an entor oct	cuis	Detailer	↓ I(T)
	► E-ma	111 A OC	liess		VIBBAT			I T					Detailet	J <u>L J</u>
	Rec	ect eiver:	s		YIDHA	HOIN TES	111230							
		Name	e Ri	ECIPIE	ENT			E-m	ail Address	s destir	nation@xx	x. xx. xx		
			Name				E	-mail Addr					Add(<u>A</u>	
	┍╺╸		Name RECIF	IENT			E	-mail Addre	BSS BXXX.XX.XX				Add(<u>A</u> Change	
			Name RECIP	IENT			E	-mail Addro	BSS BXXX.XX.XX				Add(<u>A</u> Changel Delete(J	
			Name RECIP	IENT			đ	-mail Addro	ess Dxxx xx xx				Add(<u>A</u> Changel Delete(<u> </u>
			Name RECIF	IENT			đ	-mail Addre	BSS DXXX XX XX				Add(<u>A</u> Changel Delete(
			Name RECIF	IENT			d	-mail Addressination(Add(<u>A</u> Changel Delete(<u> </u>
			Name	IENT			E	-mail Addr estination(Add(<u>A</u> Change Delete(
			Name RECIF	IENT			E	-mail Addr estination(Add(<u>A</u> Changel Delete(
			Name	IENT				-mail Addr estination(Add(<u>A</u> Changel Delete(
			Name	IENT				-mail Addr estination(ок	Add(<u>A</u> Changel Delete(1 <u>C</u>] 2) ancel
			Name	IENT				-mail Addr estination(OK	Add(<u>A</u> Changel Delete(2) ancel
			Name	Sp	ecify an	n E-Mai	il addro	-mail Addr estination(nd the E	-Mail.		ОК	Add(<u>A</u> Change Delete(<u>C</u>] 2) ancel
			Name	Spr E-1	ecify an Mail is	n E-Mai sent to t	il addro	ess to se dresses r	nd the E	-Mail. d in this	s list from	OK	Add(<u>A</u> Change Delete(C K2+.	ancel
			Name	Spr E-1 Ho	ecify an Mail is wever, re is a	n E-Mai sent to the note the mistake	il addro the add at E-M	ess to se fresses r fail may g these r	nd the E registered not be s	-Mail. d in this ent to a d addre	s list from ny addresses.	OK m the f	Add(A Change Delete() C K2+. when	ancel

4.9.3 Report Generator (Auto-generating function of the testing result report)

The function of Report Generator is for generating a report of testing result automatically when the test operation is completed.

Usually, it has a lot of trouble in generating the report of testing result for attaching the graphs and adding the description of test information. However, to use the function of Report Generator, the operator may be saved dramatically from the trouble in generating reports and the efficient operation can be realized.

In the K2+, the information that is the definition contents, the testing results and the graphs can be used by linking with Bookmarks of Microsoft® Word. The numeral values, the letters and the graphs specified as Bookmarks can be attached to the report automatically when these Bookmarks are described in Template files of Microsoft® Word.

The forms of testing result reports used frequently are recommended to be saved in a Template file of. So that the same forms of testing result reports can easily be made by one-click. Forms of testing result reports can be customized for the operator depending on his purpose by using Microsoft® Word.

Microsoft® Word is required to use this function.

Note) This function supports only for Microsoft® Word 2010, Microsoft® Word 2013, Microsoft® Word 2016 and Microsoft® Word 2019.

< Procedure (to set Report Generator) >

<Step 1>

Select "Option" from the Menu Bar. And, click "Report Generator setting".



<Step 2>

A :Press the [Corresponding] button to change the Template file of Microsoft® Word to be used or to make correspondence of the Output Items with Bookmarks newly.

 \rightarrow Go to <Step 3>.

B : Select the registration name in 'Select by registered name' to use the Output Items corresponded with Bookmarks that have already been registered.

\rightarrow Go to	<step 7=""></step>
---------------------	--------------------

Report generating condition setting	••
Corresponding Bookmark with output item Corresponding	
Select by registered name Sample1	
Setting of application common items	
Select by registered name Default 👻	
OK Cancel	

<Step 3>

Press [Select] to specify a Template file of Microsoft® Word to be used (①). (The Template file to be used is needed to be made beforehand.)

When the Template file is selected, Bookmarks set in the Template file are listed in 'Correspondence Table'.

Next, the Output Item is to be made correspondence with Bookmarks.

Select a Bookmark name to be set among the list of 'Correspondence Table' (2). And specify an Output Item from the list of 'Output Item name' (3). Press the [Change] button in Correspondence Definition(4).

Available Output Items vary in each applications as SINE/RANDOM.

<Graph Data>

The graphs displayed at generating reports are treated as the objective for 'Graph' among Output Items. When other graph data ('Operation', 'Response', etc.) is specified as output item, the graph data is outputted to the bookmark automatically even if the data is not displayed as a graph.

The setting of color and lines of the graph are selected from the items specified by "Option" \rightarrow "Graph color setting".

	Corresponding Bookmark	• Â
	Corresponding Information	
	Microsoft Word document template CMUsers\Tensks\Documents\K2_IMVtemplate_dot Select(S)	
	Correspondence table	
	Bookmark Output item name	
	Control_Condition Eundamental/Control Condition	
	Late_of_lest_End Ending time Date_of_Test_Start Beginning time	
	Graph of Test Result Braph	
٠	Operator Deprator	_ . • (
נ	Specimen Specimen Specimen	
3)	Test Condition	
	Definition	
	Backmark name Graph_of_Test_Result Change(H)	
	Output item name Graph Cancel(B)	
	Graph color 💿 Display 💿 Printer	\mathbf{i}
	Corresponding Information registration setting	×
	Registered name Sample1 Name change(C) Delete(D)	F
		(
	Common output items	

<Step 4>

The definition of 'Common Output Items' is done if it is necessary.

A: Press the [Common output items] button to change the setting of Common Output Items.

```
\rightarrow Go to <Step 5>
```

B: Specify a registration name in 'Select by the registeration name' to use the Common Output Items that have already registered.

 \rightarrow Go to <Step 6>

Microsoft Word document template		
C:\Users\Tanaka\Documents\K2_	IMVtemplate.dot Select(S).	
Correspondence table		
Bookmark	Output item name	A
Control_Condition Date_of_Test_End Date of Test Start	Fundamental/Control Condition Ending time Beginning time	
Graph of Test Result	Graph	=
Input_Condition	Input channel Operator	
Specimen	Specimen	
State_of_Test_completed	Test completion status	
Test_Condition	Control Reference	*
Definition		
Bookmark name Graph_of_Te	st_Result Change(H	
Output item name Graph	▼ Cancel(<u>R</u>	
Graph color 💿 Display 🤇) Printer	
Corresponding Information registrations	etting	
Registered name Sample1	Name change(C) Delet	
ommon output items		
elect by registered name Default	Common output item	ns <u>(E)</u>
	ОК	Cancel

<Step 5>

The information specified in Common Output Items is other than the test definitions and the testing results in Output Items displayed in Correspondence Definition.

The contents registered in this item is attached to the Bookmarks corresponded with.

The characters and the numeral values are set to the Output Item to be needed (1).

Specify a registration name of 'Common Item set' to register the set Common Output Item (2). And, press the [Name change] button (3).

When the set Common Output Item is registered in this item, it can be selected in 'Select by registered name' at $\langle \text{Step } 4 \rangle$ (or $\langle \text{Step } 7 \rangle$).

Press [OK] after completing of the necessary settings (④).

S	etting of applicat	tion common items		-X	
(Test name	Sample Test			
	Operator	Dr. IMV	Data No 001		
	Specimen	Sample Specimen A		J	
	- Common items con	figuration name			
	Registered name	Default	→ Name char	nge	
		1	<u>D</u> elete		
	/	/	ОК Са	ancel	

<Step 6>

¢١

Specify a registration name of 'Correspondence Definition Registration' to register the set Correspondence(①). And, press the [Name change] button(②).

When the set Correspondence Item is registered in this item, it can be selected in 'Select by registered name' at $\langle Step 2 \rangle$.

Press [OK] after completing of the necessary settings (③).

Correspon	ding Information					
Microsof	t Word docume	nt template				
C:\U	sers\Tanaka\D	ocuments\K2_	_IMVtemplate.dot		Select(S)
Correspo	ondence table					
Book	vmark		Output item r	ame		*
Cont	rol_Condition	1	Fundamental/	'Control Conditi	on	
Date	of Test_End		Endingtime			
Date	e of Test Star	rt voult	Beginning time	9		=
Input	t Condition	Bull	Input channel			
Oper	rator		Operator			
Spec	cimen - of Toot cou	اد ح ه دا در د	Specimen			
Test	Condition	npieteu	Control Refer	ence		-
11110						
Defin	ition					
Boo	okmark name	Graph_of_Te	st_Result		Change(<u>H)</u>
Out	tput item name	Graph		•	Cancel(<u>F</u>	3)
Graph Correspo	n color () Dis	splay (on registration s	○ Printer setting	Name observat		to(D)
Register	red name Sa	mple1	•	Name change		te[<u>D]</u>
common o	utput items					
Select by r	egistered name	Default		▼ Cor	nmon output ite	ems(<u>E)</u>
						Cancel
					700	•

<Step 7>

The definition of 'Common Output Items' is done if it is necessary.

A: Press the [Setting] button to change the setting of Common Output Items.

 \rightarrow Go to <Step 8>

- B: Specify a registration name in 'Select by the registeration name' to use the Common Output Items that have already registered.
 - \rightarrow Go to <Step 9>

Report generating condition setting Corresponding Bookmark with output item Corresponding Select by registered name Setting of application common items Select by registered name Default	▲◆◆
OK Cancel	B

<Step 8>

The information specified in Common Output Items is other than the test definitions and the testing results in Output Items displayed in 'Correspondence Table'.

The contents registered in this item is attached to the Bookmarks corresponded with.

The characters and the numeral values are set to the Output Item to be needed (1).

Specify a registration name of 'Common Item Set' to register the set Common Output Item (2). And, press the [Name change] button (3)

When the set Common Output Item is registered in this item, it can be selected in 'Select by registered name' at $\langle \text{Step } 7 \rangle$ (or $\langle \text{Step } 4 \rangle$).

Press [OK] after completing of the necessary settings (④).

Setting of applica	tion common item	5	×	
Test name	Sample Test			
Operator	Dr. IMV	Data No 001		**
Specimen	Sample Specimen A			
- Common items cor	nfiguration name			
Registered name	Default	→ <u>N</u> ame ch	ange 🖌	***
	7	<u>D</u> eleti	•	
			Cancel	

```
<Step 9>
```

Press [OK] after completing of the necessary settings.

Report generating condition setting
Corresponding Bookmark with output item
Select by registered name Sample1
Setting of application common items
Select by registered name Default
OK Cancel

<Procedure(to Report)>

Press the [Report generation] button in the state of Test completed.

When the [Report generation] button is pressed, a WORD file according to the setting of Report Generator is generated automatically.

The graphs displayed at pressing the [Report generation] button are treated as the objective for 'Graph' of Output Items.

The description in the next page is an example of the report of testing result generated by Report Generator.



< Report of testing result generated by Report Generator>



4.9.4 Quick Report

The function of Quick Report is for writing the testing result through a web browser or Microsoft® Word after a test is finished, in a similar manner to the Report Generator. It features easier setting than the Report Generator and non-necessity of Microsoft® Word. On the other hand, it does not allow fine position adjustment. Use the functions appropriately for your purpose.

If you choose Microsoft[®] Word as the destination of the result with this function, the corresponding version is the same as that of the Report Generator.

< Procedures (Selection of output items) >

<Step 1>

After a test is finished, select "File" in the menu bar and click "Quick report generation".

🤬 Qı	uickReport.swp2 - K2/	Sine						
File(F)	Test definition(T)	Operation(P)	Edit(E)	View(V)	Window(V			
1	New(N)				Ctrl+N			
3	weep test simplified o	definition(Z)						
(Open(O)				Ctrl+O			
9	Save(S)				Ctrl+S			
5	save as(A)							
ł	Register as a standard	(G)						
J	Another Excitation Sys	tem Informatio	n loading	(F)				
I	New Input Environment Information loading(I)							
I	New Input Environment Information saving(K)							
9	Save graph data(M)							
I	Print(P)				Ctrl+P			
F	Preview(V)			•				
I	Printer setting(R)		2	1				
I	^o age setup(U)							
I	Report generation(T)	. /						
(Quick report generatio	on(Q)						
ł	Recent files							
ł	Exit(X)							

<Step 2>

The dialog to select the item to be output to a quick report opens.

To add a logo, input or select the path to the targ	get image file.	
[Saves the status selected at end	ing.
Cuick concernent Comment Comme	er Pight er Right h All displayed graphs Unnecessity • Width 800 - Heigh	
PNG(Raste PNG(Raste) PNG(R	er graphics) EMF(vector graphics) Operation status Output Unnecessity Select item Frequency Cycle Reference Alam Response Abort Drive Not selected Bapsed time Not selected	Display software Web browser Output order Outline Graph Operation status Output
Either PNG (raster type) or EMF (vector type) gra selected. In the EMF, images do not get rough eve However, figures cannot displayed through any bu Explorer.	aphic image type can be en figures are enlarged. rowser other than Internet	

This dialog is of SINE. Selection items vary slightly depending on the application. Click [Output] button.

<Step 3>

Quick report is generated through the selected display software.

🏉 K2 REPC	RT - Windows Intern	et Explorer															0		
00	C:\K2Data\Q	uickReport\q	luickrep	ort.htm	ıl				•	• • • >	<	₽ Bing							• ۹
🔶 Favorit	es 🛛 👍 🙋 Sugge	sted Sites 🔻	🦲 We	b Slice	Galle	ry 🔻													
🏉 K2 REP	ORT									<u>}</u> -	5	• 🖃	-	Page	▼ Sa	fety 🔻	То	ols 🔻	•
				SI	N	E	te	est	rej	por	t								
Outli	ne																		
Testing	g time																		
9/9/2015	10:44:31 PM ~ 9	/9/2015 10):45:12	PM															
File na	me																		E
C:\test\Q	uickReport.swp2																		
Grap	h																		
10.0	m/s²																		
											•••••				••••••	•••••			
1.0		and the second se																	
	and the second second	N PARTIE		•••••	•••••								•••••••	••••			••••	•••••	
							-			•••••									
0.10	and the second s																		
																	-		
1.000e-2																			
1	0.0 Hz							10	0.0						:			100	0.0 🗸
Done								in ji	📮 Com	puter Pr	rotec	ted Mode	Off		4	<u>-</u>	e,	100%	

< Procedures (Generation of quick report with button operation)>

When a test is finished, press [Quick] button.

When the [Quick] button is pressed, a quick report is generated through the display software. Items to be output are the last settings that the quick report is generated by "Quick report generation" in the menu bar.



4.10 Waiting for Stabilization of IEPE Sensor

When using the IEPE sensor, stabilization of response of the IEPE sensor is needed after the initialization of K2+ hardware.

This function allows automatic judgment whether response of the IEPE sensor is stabilized or not.

<Outline>

When the operation start button is pressed while the IEPE sensor is used, the screen of "Waiting for stabilization of IEPE" appears. It remains displayed until response of all the IEPE sensors is stabilized. When response of all the IEPE sensors is stabilized, the screen of waiting for stabilization of IEPE automatically disappears, and the operation mode is switched to the waiting for excitation start status.

When the stop button is pressed while the screen of "Waiting for stabilization of IEPE" is displayed, the operation mode is switched to the waiting for excitation start status. In this case, note that some noises are included in response from the sensor, and thus, correct measurement may not be able to be done.

Waiting for stabilization of I	EPE 🔀
Assignment	Voltage (V)
000-Ch1	-1.5
000-Ch2	-1.4
000-Ch3	-0.0
000-Ch4	0.0
	Stop

< Judgment of stabilization >

If response of the IEPE sensor remains in the range of ± 100 mV for 5 seconds, response is judged to be stabilized.

<Process to execute application program from software>

When application programs such as SINE are executed from external software including Scheduler, the screen of "Waiting for stabilization of IEPE" is not displayed. In this case, unless response of the IEPE sensor is stabilized within 60 seconds, the initialization is judged to be failure and the test is aborted.

4.11 Customizing Toolbar Buttons

This function allows change in the order of toolbar buttons shown on the display of K2+ application and choice between display and non-display of toolbar buttons and addition of separators.

```
< Procedures >
```

<Step1>

Select [Option] in the menu bar, and click [Customize toolbar button].



<Step 2>

Remove check in the checkbox of a toolbar button not to be displayed (1).

* One or more buttons need to be displayed in each toolbar.

If order of any button needs to be changed, select the button first (2), and move the cursor with upward or downward arrow button (3).

If any separator needs to be inserted, select the button just above it, and press [Separator] button (④).

To return to the initial status, press [Reset] button (5).

After all procedures are complete, press [OK] button (6).



Message shown below appears. After the application is rebooted, display of tool bar is changed.



Chapter 5 Energy-saving operation: ECO-option (ISM)

5.1 Outline

With the ECO-option attached, K2+ realizes the energy-saving operation of the shaker system, just keeping the control accuracy and the usability of the ordinary K2+ system. By the attachment of this option, the power consumption of the shaker system is minimized for the given excitation condition. The environmentally-friendly vibration testing is realized by the "ECO SHAKER" system.

ECO-option does not work alone within the K2+ controller, but it works in collaboration with the <ISM-EM> Energy saving system to achieve the ECO SHAKER operation.

All the K2+ application software in the ECO SHAKER system must be installed with the ECOoption; mixture of the ECO-option attached applications and not attached ones is not allowed.

5.2 Constraints in operation

The test definition information must be fixed before the Energy saving operation (E-save operation) of the ECO SHAKER system is begun, and some constraints in the operation mode become necessary for this reason. The constraints in SINE and RANDOM are explained in the below

5.2.1 Constraints in SINE





- (*1) If the initial excitation level is specified to under 0dB, there is no constraints in operation. But a part of E-save functionality or whole functionality becomes invalid.
 - · Air-cooled systems : Blower control only
 - · Water-cooled systems : E-save functionality is invalid

5.2.2 Constraints in RANDOM

Common	Prompt excitation in Retry excitation is invalidated.
	The Excitation start option dialog which appears at the moment of Retry after
	stopping the excitation once in the ordinary mode is changed to a message box to
	select Yes/No of continuous excitation only.
	Excitation start option E-save mode Image: Operate the test continuously: OK Image: Operate prompt excitation. Cancel



- (*1) If the initial excitation level is specified to under 0dB, there is no constraints in operation. But a part of E-save functionality or whole functionality becomes invalid.
 - · Air-cooled systems : Blower control only
 - Water-cooled systems : E-save functionality is invalid

5.3 (This section is left blank intentionally.)

5.4 Settings for ECO-option

To make the ECO-option enabled, the ECO-option settings on K2+ are necessary to be correctly set. The ECO-option settings here affects to all of the K2+ application installed on the system.

Notice) If the setting items described here is changed incorrectly, the ECO SHAKER system would not work correctly. Please do not change the settings from those set at the shipping from the factory.

<Step 1>

"Option" is selected from the Menu bar, and "ECO mode maintenance setting" is clicked.

ow(W)	Opt	ion(O) Help(H)	-
		Set up(A) Graph color setting(G)	
view		Environment setting(E)	Stop
		AVD calculation(C)	Alarm
		Web monitor setting(W)	
		E-mail sending function setting(M)	
		Report generator setting(R)	
		ECO mode maintenance setting(I)	***
		High speed camera communication setting(H)	I °L
		Select Language(S)	

<Step 2>

A message box for caution appears. [OK] is pressed.



<Step 3>

Correct setting is done here.

<u>Required settings are completed before shipment. If any of settings needs modification, modify it after</u> <u>confirming our approval.</u>

ECO mode maintenance settings ×	
 Use ISM OK Cancel Communication settings	
URI localhost	Returns the settings to the default ones.
Module ID K2+ k2:1 ISM em:1	Select the K2+ and ISM IDs for communication.
Communication log Save log[L] Log folder C:\IMV\K2_2nd Refer[R] Data[D] Dispatch log Contents[C]	
Control the field current even at low frequency.	nunication log saving.
 Select the name (or address) of the computer the party communicating with the K2+. Norn to communicate with is installed in the same Select a communication part 	installed with the program of hally the program of the party computer as that for the K2+.
 Set the period of time in which communication	on interruption is
5.4.1 Initial setting (factory setting)

Factory setting is as shown below. To restore it, click [Initialization].

ECO mode maintenance settings X
Use ISM OK
Port No. 10002 🛓 Initialization
Timeout 3000 🔹 msec
Module ID
K2+ k2:1
ISM em:1
Communication log
Save log(L)
Log folder C:\IMV\K2_2nd
Refer(<u>R</u>)
✓ Data(D) ✓ Dispatch log ✓ Contents(C)
Control the field current even at low frequency. (The test may be stopped.)

Chapter 6 Data Viewer

6.1 Outline

DATA VIEWER is attached as the standard software to display graph data file (*.vdf) saved using a K2+ application software such as SINE.

Graphs can be operated with DATA VIEWER in the same way as data on the application software. Available functions with DATA VIEWER are also same as those on the application software such as adding pages, converting to a CSV file etc. Please see "Chapter 4" for the details of the operation and those functions.

- 1) Available data with DATA VIEWER
 - [1] Available graphs with the application software
 - [2] Available operation status with the application software
 - [3] Available test definition with the application software^{*1}
 - [4] Available history log with the application software^{*2}
- 2) Available functions with DATA VIEWER
 - [1] Available functions in graph operation with the application software
 - [2] Print function
 - [3] Report generation function using Report Generator
 - [4] Function to overlay graphs of different files

Available functions when overlaying have some limitations. Please see the next paragraph for the details.

[5] Display of different file 3D graph

Available functions when overlaying have some limitations. Please see the paragraph 4) for the details.

- [6] Report generation function using Quick Report^{*3}
- 3) Specification of the function to overlay graphs of different files
 - [1] Available data files of the application software

SINE, RANDOM, SHOCK, CAPTURE

[2] Available graph types

Waveform, SINE level tracing, PSD, Transmissibility (provided that the same unit is applied)

[3] Number of graphs which can be overlaid

64graphs

[4] Unavailable functions

Report Generator

- 4) Specification of display of different file 3D graph
 - [1] Available 3D graph display type
 - Waterfall graph, Color map
 - [2] Data file of available application software
 - SINE(SPOT test is unavailable), RANDOM, SHOCK, CAPTURE
 - [3] Available graph type

Response, Monitor, Monitor Distortion (SINE only), Drive (SHOCK only), Control error (SHOCK only)

- (Unit should be same)
- [4] Available depth axis data type

File name, Time^{*4}, Elapsed time (SINE, RANDOM only)^{*4}, Sweep count (SINE only)^{*4}, Loop count (SHOCK only)^{*4}

[5] Number of graphs displayable simultaneously

255

[6] Unavailable function

Report generator

- *1 This data is available from data saved by Ver7.0.5.0 or later.
- *2 This data is available from data saved by Ver12.2.0.0 or later.
- *3 The selection of operation status items is available from data saved by Ver12.2.0.0 or later. All information of operation status is available in all version.
- *4 This data type is available from data saved by Ver11.2.0.0 or later.

6.2 Operation example

6.2.1 Description of Icons

The commands that frequently used in the menu bar are displayed as icons on the tool bar below the menu bar. When an icon is clicked, a command corresponding with the icon is executed immediately or a dialog box corresponding with this command is opened.



This command is for opening a new graph data file and adding a new graph window.



This command is for displaying new overlaid graphs and adding a new graph window.



This command is for displaying new 3D graph and adding a new graph window.



Print



Print preview



Report generation on Microsoft Word (Report Generator)



Quick report generation on web browser or Microsoft Word(Quick Report)



This command is for adding pages to the graph window which is currently selected.



This command is for adding graphs to the graph window page which is currently selected.



This command is for adding operation status to the graph window page which is currently selected.



This command adds test definition to the graph window page being selected.



This command adds history log to the graph window page being selected.

6.2.2 Display of Standard Graph

<Procedure>

<Step 1>

Press the [Open] button.

	👷 K2/D	ata Viewer				
	File(F)	View(V) W	indow(W)	Option(O)	Help(H)	Contra Tanan
	, P		R	S		W
	Oper	o Overlaid	I 3-D Grap	n Print	Preview	Report
* <mark>-</mark>						
\cup						

<Step 2>

Select the graph data file.

n Open				×	
Look in:]]) 2nd		- 🌀 🎓 📂 🛄-		
æ	Name	*	Date modified	Туре 🔺	
Recent Places	Capture-3.10	6001.vdf2	10/19/2014 8:17 PM 10/19/2014 8:19 PM	VDF2 F	
	Capture-3.10	01.vdf2	10/19/2014 8:15 PM	VDF2 F	
	Capture-3.20	01.vdf2	10/19/2014 8:18 PM	VDF2 F	
Desktop	Random-3.10	005.vdf2	10/19/2014 6:53 PM	VDF2 F	
re-	RandomTest	-001.vdf2	11/10/2014 12:20	VDF2 F	
6-8	RandomTest	-002.vdf2	11/10/2014 12:27	VDF2 F	
Libraries	RandomTest	-003.vdf2	11/10/2014 12:34	VDF2 F	
	RandomTest	-004.vdf2	11/10/2014 12:35	VDF2 F	
	Sine-3.1001.v	/df2	10/19/2014 5:53 PM	VDF2 F	
Computer	Sine-3.1002.v	/df2	10/19/2014 5:55 PM	VDF2 F	
	Sine-3.1003.v	/df2	10/19/2014 5:57 PM	VDF2 F	
	Sine-3.1004.v	/df2	10/19/2014 5:59 PM	VDF2 F	(ก)
Network	•			,	
	File name:	Random-3.1005.vdf2	-	Open	
	Files of type:	Excitation data file(*.vdf2)	•	Cancel	
	Application	RANDOM			
	Comment				2
				ii.	

<Step 3>

Graph type selection dialog is displayed corresponding to each application software.

Select the graph to be displayed.

As for the graph type applicable to 3D graph, "Waterfall graph" or "Color map" can be selected. For details, refer to "4.3.2.1 Selecting of 3D graph".

PSD [Reference/Responses] PSD [Monitor] PSD [Drive] Transmissibility [Response]		Cancel
Transmissibility [Monitor Response waveform		
Display type	Additional display	
Display type Reference	Additional display	
Display type Reference Response	Additional display Alarm tolerance Abort tolerance	

<Step 4>

A graph window is added and the selected graph is displayed.

Graphs can be operated in the same way as graphs on the application software.



6.2.3 Display of Overlaid Graph

The screen to choose object data file of overlaid graph are available in tree display and dialogue display, selectable between them. Type of graph allowing overlaying differs depending on the screens.

6.2.3.1 Select on Tree Display

- <Procedure>
- <Step 1>

Press the [Overlaid graph] button.



<Step 2>

Overlaid graph selection dialog is displayed.

All graph data files in the folders which were opened last time with DATA VIEWER are displayed in a tree view.

Select the graph data files to be overlaid, select the graph type and then press [Add] button.



<Step 3>

Graph selection dialog is displayed corresponding to each graph type. Select the display conditions.

Transmissibility		
Input unit	Denominator	
m/s²	© Drive	
	Response	
Input channel	Input channel	
	Ch1	
Ch1 Ch2	Ch2 Ch3	
Ch3		
		2
		4
		J
Select all(A)	OK Cancel	

<Step 4>

The selected graphs are set to be subject to overlay operation.

Only graphs with the same graph type and physical quantity can be overlaid.

	File path name	Graph type
SHecycle.Bin Documents and Settings	C:\IMVData\2nd\RandomTest-001.vdf2	Transmissibility [Monitor] - Ch2 / Ch1
🖕 🚺 IMVData		`_
😑 🦺 2nd		
Capture-3.1001		
E Capture 2 2001		The graphs to be
Eapture-3.2001	The graph	data files
B RandomTest-001	The graph	overlaid are displayed
	to be over	laid are
🔣 PSD [Monitor]		
	displayed	,
M Transmissibility [Response]		
W Iransmissibility (Monitor)		
BandomTest-002		
RandomTest-003	The files with check ar	e
BandomTest-004		•
😥 📑 Sine-3.1001	overlaid.	
🖶 📄 Sine-3.1002		
ine-3.1000		
B Sine 3 2002		
👜 📑 Sine-3.3001		
🗄 📄 Sine-3.3002		
😟 🔄 Sine-3.3003		
Bine 2 2000		
Sine 3 3007		
🛓 📄 Sine-3.3009		
😥 🛅 Sine-3.3010		
🖮 📄 Sine-3.3011		
😟 🔄 Sine-3.3012		Data with
		Data unit
Intel		
📩 📙 KOD-I-		

<Step 5>

Complete the set up of graphs to be overlaid and then press the [OK] button.

· · · · · ·	File path name	Graph type
SHecycle.Bin	C:\IMVD ata\2nd\RandomTest-001.vdf2	Transmissibility [Monitor] - Ch2 / Ch1
Documents and Settings	C:\IMVData\2nd\RandomTest-002.vdf2	Transmissibility [Monitor] - Ch2 / Ch1
IMV IMVD-1-	C:\IMVData\2nd\BandomTest-003.vdf2	Transmissibility [Monitor] - Ch2 / Ch1
	C:\IMVData\2nd\BandomTest-004 vdf2	Transmissibility [Monitor] - Ch2 / Ch1
- 2nd		Transmoorping (Promotify and Form
Capture 3.1001		
Capture 3 10001		
Capture-3.2001		
BandomTest-001		
BSD [Beference/Besponse]		
B-RandomTest-002		
🖨 🖳 📄 Random Test-003		
Monitor]		
M PSD [Drive]		
🖶 🛄 Random Test-004		. 66
M PSD [Monitor]		* ()
		/ =
	<u></u>	
	Add(A) Delete(D) Vehase(P) Data	unit
B Sine-3.1003		
1004		

<Step 6>

A graph window is added and the selected graphs are overlaid and displayed.

Those graphs can be operated in the same way as those on the application software.



<To change the graph>

Press the [Change] button.



Overlaid graph selection dialog is displayed. Graphs can be added or deleted in this dialog.



Supplementary Note)

- [1] If the check box of a graph is unchecked, the graph is removed from the group of the graphs to be overlaid.
- [2] Select a graph and press the [Delete] button so that the graph is deleted from the list in the field and removed from the group of the graphs to be overlaid.
- [3] To display the different type of graphs, delete all graphs which are set up and then add new graphs.

6.2.3.2 Select on Dialogue Display

<Procedure>

<Step 1>

Press the [Overlaid graph] button.



<Step 2>

Overlaid graph data selection dialogue appears. Press [Add] button.

Overlaid graph selecti	on			—
Application type	SINE -			
Data type	Response 👻	Monitor channel	-	
Path name		Application	Depth axis data	Add(A)
		- pproduction		
			***	Delete[D]
			• <mark> </mark>	
_			U	
				0
				-
The number of display	ving data 0 / 0 Num	ber of files 0	OK	Cancel

<Step 3>

Select desired data file.

(Some files can be selected at a time.)

🎡 Open				—	
Look in:	\mu VDFFile	•	G 🤌 📂 🖽 -		
Recent Places Desktop Libraries Computer Network	Name Shock3_30%, Shock3_60%, Shock3_60%, Shock3_100% Shock3_6100 Shock4_30%, Shock4_30%, Shock4_60%, Shock4_60%, Shock4_100% Shock4_100% Shock5RS1_3 Shock5RS1_3 Shock5RS1_6 Shock5RS1_6 Shock5RS1_6 Sine1_0dB.vd Sine110dB.vd Sine1_6_0dB.vd Sine1_6_0dB.vd Sine4_0dB.vd Sine4_0dB.vd	vdf2 vdf2 vdf2 s.vdf2 0%.vdf2 vdf2 0%.vdf2 0%.vdf2 0%.vdf2 0%.vdf2 0%.vdf2 0%.vdf2 100%.vdf2 f2 vdf2 vdf2 f2 vdf2 vdf3 vd6 vd6 vd7	Date modified 6/15/2017 2:23 PM 6/15/2017 2:24 PM 6/15/2017 2:26 PM 6/15/2017 2:36 PM 6/15/2017 2:35 PM 6/15/2017 2:35 PM 6/15/2017 2:37 PM 6/13/2017 11:57 AM 6/13/2017 11:57 AM 6/13/2017 11:57 AM 6/13/2017 11:57 AM 6/12/2017 1:06 PM 6/12/2017 1:02 PM 6/12/2017 1:02 PM 6/12/2017 1:31 PM 6/12/2017 1:21 PM 6/12/2017 1:4 PM	Type Excitat E	
	Sine4_10dB.	vdf2 vdf2 "Sine4_G_0dB.vdf2" "ShockSRS" Excitation data file(*.vdf2) SINE	6/12/2017 1:14 PM 6/12/2017 1:38 PM 1_30%.vdf2" ▼	Excitat Excitat Open Cancel	

<Step 4>

Selected data files are set as the target of overlaid.

Select application type, display type and data type.

If the data type is set to "Monitor", select the monitor channel.

If data files different from the selected application type are displayed, they are displayed in gray.



<Step 5>

Graph window is added, and the selected graph appears.



<Change of displayed graph>

Press the [graph change] button.

🔛 K2/Data Viewer - [Overlaid Graph]	
File(E) View(V) Window(W) Option(O) Help(H)	_ & ×
Open Overlaid 3-D Graph Print Preview	ick Page Graph Status Page
Overlaid Graph	
Overlaid Graph	
🖳 🖳 🖾 🔛 🔍 🖀 💶 🖀 🛣 🖾 🖾 🔝 🔝	
10.0 ^{m/s²}	[Sine1_0dB] Response [Sine110dB] Response [Sine110dB] Response [Sine10dB] Response [Sine10dB] Response
	NUM

Application type	SINE -			
)ata type	Response 🗸	Monitor channel	v	
Path name		Application	Depth axis data	Add(<u>A</u>)
C:\K2DataW	/DFFile\ShockSRS1_30%.vdf2	SHOCK(SRS)	2017/06/13 11:56:44	
C:\K2Data\\	/DFFile\ShockSRS1_60%.vdf2	SHOCK(SRS)	2017/06/13 11:57:19	
C:\K2Data\\	/DFFile\ShockSRS1_100%.vdf2	SHOCK(SRS)	2017/06/13 11:57:41	/
🔲 C:\K2DataW	/DFFile\ShockSRS1_G_100%.vdf2	SHOCK(SRS)	2017/06/13 12:58:18	
C:\K2Data\VDFFile\Sine1_0dB.vdf2		SINE (Sweep)	2017/06/12 13:06:08	
C:\K2Data\VDFFile\Sine14dB.vdf2		SINE (Sweep)	2017/06/12 13:04:46	
C:\K2Data\\	/DFFile\Sine110dB.vdf2	SINE (Sweep)	2017/06/12 13:02:54	
C:\KSData\V	/DFFile\Sine1_G_0dB.vdf2	SINE (Sweep)	2017/06/12 13:31:27	
Unche	ecked items are not the	I	Deletes from Overlaid grapl	n display
object	s of Overlaid graph.	2	area and Overlaid graph targ	gets
			7	
	Overla	ud graph display area	J	
				-

Overlaid graph data selection dialogue appears. Addition or deletion of desired graph is allowed.

Supplementary Note)

- [1] Unchecked graphs are excluded from Overlaid graph targets.
- [2] Select desired graphs and press the [Delete] button. Then, they are deleted from the Overlaid graph display area and Overlaid graph targets.

6.2.4 Display of 3D graph

<Procedure>

<Step 1>

Press [3D graph] button.

🔐 K2/Data	Viewer									
File(F) Vi	ew(V) Win	ndow(W)	Option(O)	Help(H)						
Open	Overlaid	3-D Graph	Print	Preview	Report	Page Page	Greph Graph	Status	Definition	
)						

<Step 2>

3D graph data selection dialogue appears. Press [Add] button.

3-D graph data selecti	ion					×
Application type Data type Depth axis data type	SINE Response Time	Display Monitor	type channel	Waterfall graph	▼ ▼	
Path name			Application		Depth axis data	Add(A)
					Ċ	Delete(D)
The number of display	ving data 0 / 0 N	lumber of files	0			IK Cancel

<Step 3>

Select desired data file.

(Some files can be selected at a time.)

🏫 Open				×
Look in:	\rm 🖟 2nd		• G 🜶 📂 🖽 •	
Æ	Name	*	Date modified	Туре 🖍
	Sine-3.3G00	2.vdf2	10/19/2014 6:34 PM	VDF2 File
Recent Places	Sine-3.3G00	3.vdf2	10/19/2014 6:36 PM	VDF2 File
	Sine-3.3G004	1.vdf2	10/19/2014 6:38 PM	VDF2 File
	Sine-3.1001.	vdf2	10/19/2014 5:53 PM	VDF2 File
Desktop	Sine-3.1002.	vdf2	10/19/2014 5:55 PM	VDF2 File
Æa	Sine-3.1003.	vdf2	10/19/2014 5:57 PM	VDF2 File
6 3	Sine-3.1004.	vdf2	10/19/2014 5:59 PM	VDF2 File
Libraries	Sine-3.1005.	vdf2	10/19/2014 6:00 PM	VDF2 File
	Sine-3.2001.	vdf2	10/19/2014 5:50 PM	VDF2 File
	Sine-3.2002.	vdf2	10/19/2014 5:51 PM	VDF2 File
Computer	Sine-3.2003.	vdf2	10/19/2014 5:53 PM	VDF2 File
0	Sine-3.3001.	vdf2	10/19/2014 6:02 PM	VDF2 File
	Sine-3.3002.	vdf2	10/19/2014 6:04 PM	VDF2 File
Network	Sine-3.3003.	vdf2	10/19/2014 6:07 PM	VDF2 File
	Sine-3.3004.	vdf2	10/19/2014 6:08 PM	VDF2 File
	Sine-3.3005.	vdf2	10/19/2014 6:08 PM	VDF2 File
	Sine-3.3006.	vdf2	10/19/2014 6:10 PM	VDF2 File
	Sine-3.3007.	vdf2	10/19/2014 6:10 PM	VDF2 File 🗐
	Sine-3.3008.	vdf2	10/19/2014 6:12 PM	VDF2 File 👻
	•	III		Þ
	File name:	"Sine-3.1005.vdf2" "Sine-3.10	02.vdf2" "Sine-3.10 🔻	Open
	Files of type:	Excitation data file(*.vdf2)	- /	Cancel

<Step 4>

Selected data files are set as the target of overlaid.

Select application type, display type, data type, and depth axis data type.

If the data type is set to "Monitor", select the monitor channel.

If data files different from the selected application type are displayed, they are displayed in gray.



<Step 5>

Graph window is added, and the selected graph appears.

• Display example of waterfall graph



• Display example of color map



<Change of displayed graph>



3D graph data selection dialogue appears. Addition or deletion of desired graph is allowed.

+F	-			-	
)ata type	Response -	Monitor c	hannel		
epth axis data type	e Time 🔻				
Path name			Application	Depth axis data	Add(A)
C:\IMVData\2	nd\Random-3.1002.vdf2		RANDOM(RANDOM)	2014/10/20 10:52:16 AM	Deletel
C:\IMVData\2	2nd\Random-3.1003.vdf2		RANDOM(RANDOM)	2014/10/20 10:52:31 AM	Deletet
C:\IMVData\2	nd\Random-3.1004.vdf2		RANDOM(RANDOM)	2014/10/20 10:52:46 AM	7
C:\IMVData\2	2nd\Random-3.1005.vdf2		RANDOM(RANDOM)	2014/10/20 10:52:58 AM	
C:\IMVData\2	advSine-3.1002.vdf2		SINE (Sweep)	2014/10/20 9:55:56 AM	4 💌
CAMPUData A2	2003/06-3.1003.7072		SINE (Sweep)	2014/10/20 9:57:28 AM	
C. \IMVData\2	nd\Sine-3.1004.vdr2		SINE (Sweep)	2014/10/20 3:33:00 AM	
Unche	ecked items are not the s of 3D graph.		Deleand	etes from 3D graph dis 3D graph targets	play are
	3D	graph	display area]	

Supplementary Note)

- [1] Unchecked graphs are excluded from 3D graph targets.
- [2] Select desired graphs and press the [Delete] button. Then, they are deleted from the 3D graph display area and 3D graph targets.

6.3 Supplemental Explanation

6.3.1 Set Up

<Procedure>

Select "Option" in the menu bar and click "Set up". A dialog of 'Set up' appears.

		ition(O) Help(H)		
***		Set up(A) Graph setting(G)		
	Grap	Report generator setting(R).		
		Customize toolbar button(C Select language(S))	
	Colum			
	Set up			
	⊂ Transn ⊚ dł	nissibility display unit 3 🔿 % 💿 Unit/Unit	OK Cancel	
	Display	re Initialize		
	Overla ▼ Sel	id graph ect on tree display		

[Transmissibility display unit]

This item is for selecting the display unit of amplitude value in Transmissibility Graph.

This unit selected in this item is valid only for the transmissibility graphs calculated from the two data giving the same unit.

In case that the transmissibility graph is calculated from the two data having different units, the display unit of amplitude always appears as 'Unit/Unit'.

[Display config.]

• 'Store' check box

Check 'Store' to store the display configuration. Display configuration is stored for each test type.

If data file of the test type including the stored display configuration information is selected, graph selection dialogue is not displayed, but graphs are automatically displayed with the stored display configuration.

The display configuration information is updated when the display conditions including graph scales are modified.

Uncheck 'Store' not to store the display configuration modified thereafter.

'Initialize' button

Select 'Initialize' to format the display configuration.

If it is initialized, the screen configuration information of all the test types is initialized. When graph is displayed at the next time, the graph selection dialogue is displayed after data file is selected.

<Overlaid graph>

• 'Select on tree display' check box

Select it to choose data file in a tree display.

Chapter 7 Launcher

7.1 Outline

Launcher is the software to start up the K2+ application (application software) including SINE. Though the Launcher is the standard attached software, partial functions are optional.

Launcher has the three modes shown below.

- 1) 'Applications' mode
- 2) 'Standards' mode
- 3) 'Test files' mode

Note) 'Standards' mode and 'Test files' mode need standard options.

1) 'Applications' mode

K2+ applications including SINE can be simply started.

2) 'Standards' mode (standard options are needed)

In this mode, test conditions can be selected in the list of standards such as ISO, and test can be executed without detailed test definition.

Operation procedures are as follows: 'Selecting standards' \rightarrow 'Test reference check' \rightarrow 'Test file saving'. When 'Test file saving' is executed, application is automatically started, and the hardware is initialized, and shifted to the status of waiting for excitation.

Ap	plication	and tes	t types	applicat	ole to	this	mode	are as	shown	below.
----	-----------	---------	---------	----------	--------	------	------	--------	-------	--------

Application	Test type
SINE	SINE SWEEP[sweep test](*.swp2) / SINE SPOT[spot test](*.spt2)
RANDOM	RANDOM[random](*.ran2) / SOR(*.sor2) / ROR(*.ror2)
SHOCK	SHOCK(*.sho2) / SRS SHOCK(*.srs2)
Multi-Sweep Sine	MSS FREQ[frequency division sweep](*.fds2) / MSS TIME[delay sweep](*.tis2) / MSS SPOT[multi spot](*.msp2)

3) 'Test files' mode (Standard option is required)

This mode allows the selection of existing test files to execute test.

Operation procedures are as follows: 'Test file selection' \rightarrow 'Test reference check' \rightarrow 'Test file saving'.

When 'Test file saving' is executed, application is automatically started, and the hardware is initialized, and shifted to the status of waiting for excitation.

Application and test types applicable to this mode are the same as those of the 'Standards' mode.

7.1.1 Precautions for 'Standards' Mode and 'Test Files' Mode

<u>Although test conditions based on the standards are input in advance in</u> <u>'Standards' mode, they should be regarded as references only. When executing</u> <u>test, be sure to refer to the standards, and fully check the test conditions.</u>

7.1.1.1 Preparation

In the 'Standards' and 'Test files' modes, test files are created with using the top information registered in the excitation system information and input environment information. <u>Be sure to</u> <u>create excitation system information and input environment information</u> before executing the test.

For the creating procedures of excitation system information and input environment information, refer to "Chapter 3 K2+ System Setting".

7.1.1.2 Change of Excitation System Information

When changing the information of the excitation system to be used in the 'Standards' and 'Test files' modes, change the top information of the excitation system information.

7.1.1.3 Limit of Control Channel

In the 'Standards' and 'Test files' modes, the test with the control channel limited to 1ch is executed.

<u>When executing the test such as average value control, open test files from applications</u> <u>and change the control channel setting.</u>

The modified test file can be executed in 'Test files' mode without changes.

7.2 Operation Example

For the startup procedures of the Launcher, refer to "4.2.1 Application Start Up" in Chapter 4. As for the finishing of the Launcher, refer to "4.2.2 Exit from Application" in Chapter 4.

Note) If the excitation system information and input environment information have not been defined, the screen of 'Environment setting' appears at startup.

7.2.1 'Applications' mode

- < Procedures >
- <Step 1>

Press the button of [Applications].



<Step 2>

The list showing the icons of applications installed is displayed. Select the icon of application to be started up, and press the button of [Next].



```
<Step 3>
```

The screen of the application being started up appears.



The selected application starts up. As for the later operating procedures, refer to the instruction manual of the applications.

🔬 K2/	Sine															, • 💌
File(F)	Test defi	nition(T)	Operation(P)	Edit(E)	View(V)	Window(W)	Option(O)	Help(H)								
Nev	w Simp	le Ope	n Test save	Data sav	e Print	Preview	Report	Ope. start	Ope. end	Start	Retr		Stop	Pause	Restart	Calibration
<u>,</u>																
Fre	quency Hz	Referen		ponse	Drive m\	<mark>/ Ор</mark>					Orive	Limit	Alarm	Abort		
Next	Ŀ															
Chang) ge															
Add																
Delet	e															
Undefin	F															
													NU	М	2/10/2015 1	1:36:42 AM

7.2.2 'Standards' Mode

- <Procedures>
- <Step 1>

Press the button of [Standards].



<Step 2>

Select any 'Standard', and choose any standard name in the standard list. After the 'Standard name' is selected, press the button of [Next].

her		_	
			Standards Test files Applications
Test Summ	ary	Standard	ISO V
	Lithium-ion battery		Find Clear
	RANDOM	Please seler	the item on the list and press (Nevt) hutton
	[Use Conditions]	Type	Standard name
	Electric/electronic devices of battery pack and system	RANDOM	ISO 12405-1:2011 Electrically propelled road vehicles Lithium-ion batteryTest Pr
	[Direction]	RANDOM	ISO 12405-1:2011 Electrically propelled road vehicles Lithium-ion batteryTest Pa
	Each direction	RANDOM	ISO 12405-1:2011 Electrically propelled road vehicles Lithium-ion batteryTest Pa
		RANDOM	ISO 12405-1:2011 Electrically propelled road vehicles Lithium-ion batteryTest Po
		RANDOM	ISO 12405-1:2011 Electrically propelled road vehicles Lithium-ion batteryTest Provide the second sec
		SHOCK	ISO 12405-1:2011 Electrically provelled road vehicles Lithium-ion batteryTest SI
		SOR	ISO 16750-3:2012 Auto Parts Commercial Car Test 6 (SOR)Engine/Gearbox
	30.6255 m/s2 rms	RANDUM	ISU 16750-32012 Auto Parts Commercial, at Nest 6 Engine/Gearbox
		BANDOM	ISO 16750-3:2012 Auto Parts Commercial To Parts Representation
	0.2002 m/s rms	BANDOM	ISO 16750-3:2012 Auto Parts Commercial Auto Parts Commercial
		BANDOM	ISO 16750-3:2012 Auto Parts Commercial Const 8 Decoupled Cab
	2.5554 mm rms	RANDOM	ISO 16750-3:2012 Auto Parts Commercial Car Test 8 Decoupled Cab
		SOR	ISO 16750-3:2012 Auto Parts Passenger Car Test 1 (SOR)Engine(5≦ Cylinder)
		SOR	ISO 16750-3:2012 Auto Parts Passenger Car Test 1 (SOR)Engine(6≧ Cylinderr)
	8.00-00	SOR	ISO 16750-3:2012 Auto Parts Passenger Car Test 1 (SOR)Engine(All Cylinder)
	0.00.00	RANDOM	ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine
		•	



<Step 3>

Test reference check screen appears. This screen depends on the test types.

This example shows the test type of RANDOM.

Items related to the test time and those related to the control channel can be changed here.

Change them if required, and press the button of [Next].



<Step 4>

The test file saving screen appears.

Select the save location folder, enter file name, and press the button of [Save]. If any existing file is included, the message of confirming overwriting appears.



<Step 5>

The screen noticing the startup of application appears.



After the application is started, test files are read in, and the hardware initialization is automatically complete. As for the later operation procedures, refer to the instruction manual of applications.

IS012045-1_2011_Part2_20150210.ran2 - K2/Random Sir/D Tet 4.6 No	
File(F) Test definition(T) Operation(F) Edit(E) DispLay(V) Window(W) Option(O) Help(H)	
New Simple Open Test save Data save Print Preview Report Ope. start Ope. end Start Retry	Stop Pause Restart
Beference Level Besnonse Drive Flansed-time Best-time Drive Limit Alarm	Abort
30.6255 0.00 0.0 0.0 0.00 8.00.00 m/s²ms dB m/s²ms mVms Im Im <t< td=""><td>0</td></t<>	0
Reference/response Operation status	Level
Operation status	0.00
Next Waiting for operation start.	0.00
2015/02/10 11:48:55 AM Loop count 0 Elapsed time 0:00:00 (remains 8:00:00)	dB
Change Level 0.00 dB (Increment +2.00 dB) Check result Alarm OK Abort OK Real-time processing CPU load factor 0.00 % (Peak 0.00 %)	Increment 2.00
Add Reference data X 30.6255 m/s ² ms	
Response data	
X 0.0 m/s ² ms	
Tolerance Alarm check Abort check OFF Basic 0.00[0.00] 0.00[Hz	
Undefined Input channel data	
X Ch1 (000-Ch1) 0.0 m/s ² ms	
X Ch2 (000-Ch2) 0.0 m/s ² ms	
Waiting for operation start.	2/10/2015 11:48:55 AM

Note) Main errors during execution

• When definition error occurs

After application is started up^{*}, definition error occurs, and the definition is completed.

• In case there is application of which test is being executed

After application is started up^{*}, execution start process fails, and the definition is completed. There will be no influence on the test being executed.

*) If the same application is started up in the 'Standards' and 'Test files' modes, no more application will be newly started up.

7.2.3 'Test files' mode

- <Procedures>
- <Step 1>

Press the button of [Test files].



<Step 2>

Press any of the buttons of 'History', 'Favorite', or 'Folder'.

In this example, 'Folder' is selected.

Select any test file displayed in the list.

After your desired test file is selected, press the button of [Next].



<Step 3>

The test reference check screen appears. The screen differs according to the test types. This example shows the test type of SINE SWEEP.

Items related to the test time and those related to the control channel can be changed here. Change them if required, and press the button of [Next].


<Step 4>

The test file saving screen appears.

Select the save location folder, enter file name, and press the button of [Save]. If any existing file is included, the message of confirming overwriting appears.

Save As			×
Sa	ave in: 📗 My Documents	G 🤣 📂 🛄 -	
e	Name	Date modified Type	
Recent Pl	New folder	3/31/2014 2:38 PM File fol	der
	SineSweep-'torisetu-4.3.5.swp2	2/6/2015 10:34 AM SWP2 1 2/6/2015 10:36 AM SWP2 1	File File
Librario	es		
	1		
Compu	ter		
Netwo	rk		<u> </u>
	File name: 16750-3_2012_Test1_Curve1_2	0150210.swp2	۲
	Save as type: Sweep test file(*.swp2)	▼ Cancel	
	Comment		
	L		di

```
<Step 5>
```

The screen noticing the starting of application appears.



After the application is started, test files are read in, and the hardware initialization is automatically complete. As for the later operation procedures, refer to the instruction manual of applications.

(in 1901675	50-3_2012_Test1_Curve1_2015	0210.swp2 - K2/Sine					
File(F) Te	est definition(T) Operation	P) Edit(E) View(V) W	indow(W) Option(O)	Help(H)			
New	Simple Open Test s	ave Data save Print	Preview Report	Ope. start Ope. end	Start Retry	Stop Pause	Restart Calibration
Frequer 10	ncy Reference F 0.00 100.0 Hz m/s ² 0-p	lesponse Drive 0.0 0. m/s² 0-p mV 0-	Elapsed time Vi 0 0:00:00	bration Cycle Rest tim 0 22:00 cycle	e Drive Limit	Alarm Abort	
	Reference/Response	Operation status					
R L	Operation status					— X	
Next	Waiting for excitation st	art				*	
	Frequency 100.00 Ref.(m/s²0-p) F 100.0	Hz 2015/02/10 1 tesp.(m/s ² 0-p) 0.0	1:58:52 AM Drive(mV) 0.0			E	
Change	Elapsed time 0:00:00	0 cycle	(Remains 2	2:00:00)			Level
ΞÞ	Sweep Forward(F)	1 double-sweep	fication 10				0.00
Add	Check result	Alarm 0	K Abort	ОК			dB
	Real-time processing (PU load factor 0	.00 %				
	Reference/Response	lata					Increment
Delete	Acceleration	Velocity	Displaceme	nt			1.00
	(m/s ²)	(m/s)	(mm)				
OFF	Resp. 0.0	0.0	0.0				Sweep ratio
Undefined	land the set of the						1.0
	Peak estimation	Acceleration	Velocity	Displacement	Phase		times
		(m/a2)	(m/n)	(mm)	(degree)	v	
Waiting for	excitation start					NUM	2/10/2015 11:58:52 AM

Note) Main errors during execution

• When definition error occurs

After application is started up^{*}, definition error occurs, and the definition is completed.

• In case there is application whose test is being executed

After application is started up^{*}, execution start process fails, and the definition is completed. There will be no influence on the test being executed.

*) If the same application is started up in the 'Standards' and 'Test files' modes, no more application will be newly started up.

7.3. Supplementary Explanation

7.3.1 Registration and Deletion of Standard Items

Test files in the test types applicable to the 'Standards' mode can be registered as standard items. The registered standard items are recorded as the standard of 'Others' in the 'Standards' mode.

7.3.1.1 Registration of Test Files as Standards

Standard items can be registered through the individual applications.

< Procedures >

<Step 1>

In the status of definition completion of individual applications, select 'File', then 'Register as standard' in the menu.



<Step 2>

Input standard name, field, and test conditions, and press the button of [Register].

If the same standard name is found, the message noticing the overwriting registration appears.

- Note) Even if test files registered as standards are changed after registration, the change will not be reflected to the standards.
 - In the test conditions registered as standards, information to be added after text is executed (continuous operation data, transfer function data, drive data, etc.) is deleted.
 - If test files executing average value control and limit control are registered as standards, those information will not be taken over.



<Step 3>

When 'Standard' is set to 'Others' in the 'Standards' mode of the Launcher, the registered standard items (standard names) are added to the list.

When any standard name is selected, contents registered through individual applications are displayed in the 'Test Summary' area. The registered test file information is set to the reference maximum values and the test time.



7.3.1.2 Deletion of Registered Standards

Registered standard items can be deleted through the Launcher. Note) Standard items to be installed in advance cannot be deleted.

< Procedures >

<Step 1>

Set 'Standard' to 'Others' in the 'Standards' mode of the Launcher.

Select the standard name to be deleted, and press the button of [Delete].

Even after any standard item is deleted, original test file registered as a standard will not be deleted.

ncher						a 1' 1'
			Standards			Applications
—Test Summ	ary	Standard	Others	-		
	An endurance test				Find	Clear
	SINE SWEEP	Please selec	ct the item on the list	and press [Next] button.	
	temperature Test time depends on the numbers of test INFORMATIVE. The numbers of test INFOMATIVE is one in this case two:15H three:12H	Type SINE SWE SINE SWE	Standard name SWEEP_Company ste SWEEP_Company ste	undard A-19 undard A-11	× (3)	
	200.0 m/s2 0·p					
	0.1592 m/s 0·p					
	0.5066 mm p-p					
	22:00:00			m		
¢ 🕈		Delete			Next(<u>N</u>) >	Close(<u>C</u>)

7.3.2 Supplementary Explanation of Standards Mode

7.3.2.1 Contents Displayed on Screen



without license is selected, the next screen will not appear.

7.3.2.2 Finding of Standards

Standards required can be found from the registered standard items by arbitrary keywords.

< Procedures >

<Step 1>

Select 'Standards' mode, and select any standard to be found.

In this example, 'All' is selected. In this case, all the registered standard items are to be objects of finding.

Enter keywords into the input area, and press the button of [Find'.

K2/Launcher	_	
		Standards Test file: Applications
Test Summary	Standard All	• • • /
Category	Auto Parts	Find Clear
Test Type	Please select	the item on the list and press (Next) button
Test condition	Type	Stendard name
	SINE SPOT SINE SWEEP SINE SWEEP SINE SWEEP SINE SWEEP SINE SWEEP SINE SWEEP	JIS D 1601:1995 Auto Parts Endurance Test INFORMATIVE JIS D 16750-3:2012 Auto Parts Commercial Car Test 6 Engine/Se ISO 16750-3:2012 Auto Parts Passenger Car Test 3 Flexible Ple ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine(All ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine(S≦ Cylinder) ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine(6≧ Cylinder) ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine(6≧ Cylinder) ISO 16750-3:2012 Auto Parts Passenger Car Test 2 Gearbox
Max	RANDOM	ISO 16/50-3:2012 Auto Parts Commercial Car Test 8 Decoupled Cab ISO 16750-3:2012 Auto Parts Commercial Car Test 6 Engine/Gearbox
acceleration	RANDOM	ISO 16750-3:2012 Auto Parts Commercial Car Test 8 Decoupled Cab
Max, velocity	RANDOM	ISO 16750-3:2012 Auto Parts Commercial Car Test 7 Unsprung Masses
Max. displacement	RANDOM RANDOM RANDOM RANDOM	ISO 16/5U-3:2U12 Auto Parts Commercial Car Test 8 Decoupled Cab ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine ISO 16750-3:2012 Auto Parts Passenger Car Test 2 Gearbox ISO 16750-3:2012 Auto Parts Passenger Car Test 4 Unsprung Masses
Test time	RANDOM	ISO 16750-3:2012 Auto Parts Passenger Car Test 5 Sprung Masses
	SOR	ISO 16750-3:2012 Auto Parts Commercial Car Test 6 (SOR)Engine/Gearbox
¢ •		Next(<u>N</u>) > Close(<u>C</u>)

<Step 2>

Standard items including the keywords entered in the area of 'Standard name, Test summary, type' is displayed in the list.

To release the finding result using keywords, press the button of [Clear].

cher	_	_		/
		Standards	Test files	Applications
Test Summary	Standard A	1	•	
	Auto Parts			Find Clear
	Please select	the item on the list ar	nd press [Next] button	
	SINE SPOT SINE SPOT SINE SWEEP SINE SWEEP SINE SWEEP SINE SWEEP SINE SWEEP SINE SWEEP RANDOM RANDOM RANDOM RANDOM RANDOM RANDOM RANDOM RANDOM RANDOM RANDOM RANDOM RANDOM	JIS D 1601-1995 Auto Pe ISO 16750-3:2012 Auto F ISO 16750-3:2012 Auto F	Arts Endurance Test INFOR Parts Commercial Car Test Parts Passenger Car Test Parts Commercial Car Test Parts Passenger Car Test Parts Passenger Car Test Parts Passenger Car Test Parts Passenger Car Test	MATIVE 6 Engine/Gearbox 3 Flexible Plenum Chamber 1 Engine(All Cylinder) 1 Engine(5≧ Cylinder) 1 Engine(6≧ Cylinder) 2 Gearbox 8 Decoupled Cab 6 Engine/Gearbox 8 Decoupled Cab 7 Unsprung Masses 8 Decoupled Cab 9 Decoupled Cab
2 •				Next(N) > Close(C

7.3.2.3 Test summary Information Registered in Saved Test File

• Test type

• Test condition

Test summary information is automatically registered in the test file saved in the 'Standards' mode. Contents to be registered are as shown below.

- Field : Contents of selected standards are taken over.
 - : Contents of selected standards are taken over.
 - : Standards and standard names are registered.
- Reference maximum value information : Contents of selected standards are taken over.
- Test time : Defined contents are registered.

When the test file saved in the 'Test files' mode is selected, contents registered here are displayed as the Test summary information.

7.3.2.4 Setting of control channel

In the 'Standards' mode, the control channel can be selected from the input channels that are defined in the top information registered in the input environment information.

All defined input channels in the top information except the selected channel as control channel are set to the monitor channel.

<u>When change of the monitor channel setting is needed, open the test file from</u> applications and change the setting.

7.3.2.4.1 Use the original sensitivity of input environment information

Check the check box of "Select input environment information".



The first channel of the top information registered in the input environment information is displayed. Select the control channel from the displayed input channel list.

The sensitivity of the selected input channel can NOT be changed.

The test file saving screen appears after the button of [Next]is pressed.

7.3.2.4.2 Modify the sensitivity of input environment information

Clear the check box of "Select input environment information".



The first channel of the top information registered in the input environment

information is displayed. Select the control channel from the displayed input channel list.

<u>The sensitivity of the selected input channel can be changed.</u> The sensitivity of the input environment information is not changed by this modification.

The test file saving screen appears after the button of [Next]is pressed.

7.3.3 Supplementary Explanation of Test Files Mode

7.3.3.1 Folder

7.3.3.1.1 Contents Displayed on Screen

When 'Folder' is selected in the 'Test files' mode, the list of test files in the selected folder is displayed.

pm/		Standards Test files	Applications
Test Summ	ary	D:\Users\imv\Documents	Select Fold
	Automobile	History Favorite Folder	<u> </u>
	SINE SWEEP	Please select the item on the list and press [Next] button.	
	ISO	Type File name	Modified
	ISD 16790-3:2012 Auto Parts Passenger Car Test 1 Engine (5≦Cylinder)	SINE SWEEP ISO16/50-3_2012_1est_CutVe1_20150210 SINE SWEEP SineSweep_torisetu-4.3.5 SINE SWEEP Sweep_ACCmps2_435 RANDOM ISO12045-1_2011_Part2_20150210 RANDOM JISE4031_2013_LT_Cat1A_Longitudinal_20150210	2015/02/10 11 2015/02/06 10 2015/02/06 10 2015/02/10 11 2015/02/10 12
	200.0 m/s2 0·p		
	0.1592 m/s 0-p		
	0.5066 mm p-p		
	22:00:00		
¢ 🕈		Delete Register in Favorite Next	(<u>N</u>) > Close(<u>C</u>)
summary in s displayed. dards', only	formation of the s For the test files r / test type is displa	elected test not created by ayed.	
	Test files	in the selected test folder are displayed. The di	splayed
	test files a	ire of the test types applicable in the 'lest files is in grav characters are the items of test types is	without
	license F	ven if the test file of the test type without licen	se is
	neense. L	he want concernent will not concern	

[Select Folder]	: Folder to be displayed can be selected.
[Delete]	: Selected test file can be deleted.
[Favorite]	: Selected test file can be registered to 'Favorite'.

7.3.3.1.2 Test summary Information Registered to Saved Test File

Test summary information can be registered into the saved test file automatically. Contents to be registered are as shown below.

- Field : Contents of selected test file are taken over.
- Test type : Contents of selected test file are taken over.
- Test condition : Contents of selected test file are taken over.
- Reference maximum value information: Contents of selected test file are taken over.
- Test time : Defined contents are registered.

When the test file saved in the 'Test files' mode, contents registered here are displayed as the Test summary information.

7.3.3.2 History

7.3.3.2.1 Contents Displayed on Screen

When 'History' is selected in 'Test files' mode, the list of test files executed in the past is displayed.

////		Stan	dards	Test files	Ap	plications
Test Sumn	nary	D:\Users\im\\Document	S			Select Folder
	Automobile	History	avorite	Folder		
	SINE SWEEP	Please select the iter	n on the list a	nd press [Next] bu	tton.	
	ISO	Type File n	ame			Modified
	ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine (5≦Cylinder)	RANDOM JISE4	031_2013_LT_C 750-3_2012_Te: 045.1_2011_De:	at1A_Longitudinal_20 at1_Curve1_20150210	150210	2015/02/10 12:3 2015/02/10 11:5 2015/02/10 11:4
				1		
	200.0 m/s2 0-p			1		
				1		
	0.1592 m/s 0·p					
	0.1592 m/s 0-p 0.5066 mm p-p					
	0.1592 m/s 0-p 0.5066 mm p-p 22:00:00					
Max. velocity Max. displacement Test time	0.1592 m/s 0-p 0.5066 mm p-p 22:00.00	Delete	gister in Favorite	,	Next(<u>N</u>) >	Close(<u>C</u>)
Max velocity Max displacement Test time	0.1592 m/s 0-p 0.5066 mm p-p 22:00:00	Delete	gister in Favorit		Next(<u>N</u>) >	Close(Q)
Max. velocity Max. displacement Test time	0.1592 m/s 0-p 0.5066 mm p-p 22:00:00 ary information of	Delete Re	gister in Favorite		Next(<u>N</u>) >	Close(<u>C</u>)
Max velocity Max displacement Test time Cest summ ile is displ	0.1592 m/s 0-p 0.5066 mm p-p 22:00:00 ary information of ayed. If the test file	Delete Re the selected test e is not created	gister in Favorite		Next(<u>N</u>) >	Close(<u>C</u>)
Max velocity Max displacement Test time Cest summ Test summ Test summ Test summ	0.1592 m/s 0-p 0.5066 mm p-p 22:00:00 ary information of ayed. If the test file dards', only test typ	Delete Re the selected test e is not created pe is displayed.	gister in Favorite	,	Next(N) >	Close(<u>C</u>)
Max velocity Max, deplacement Test time Test summ Test summ ile is displ rom 'Stand	0.1592 m/s 0-p 0.5066 mm p-p 22:00:00 ary information of ayed. If the test file dards', only test typ	Delete Re the selected test e is not created pe is displayed.	gister in Favorite		Next(<u>N</u>) >	Close(<u>C</u>)
Max velocity Max. doplacement Test time Cest summ file is displ from 'Stand	0.1592 m/s 0-p 0.5066 mm p-p 22:00:00 ary information of ayed. If the test file dards', only test typ	Delete Re the selected test e is not created pe is displayed.	gister in Favorite	, iles executed	Next(N) >	Close(<u>C</u>) rds' mode

[Delete] : Selected test file can be deleted. Test file itself cannot be deleted.

[Favorite] : Selected test file can be registered to 'Favorite'.

7.3.3.2.2 Test summary Information Registered to Saved Test File

Similar to 'Folder'. Refer to "Section 7.3.3.1.2".

7.3.3.3 Favorite

7.3.3.3.1 Contents Displayed on Screen

Select 'Favorite' in the 'Test files' mode.

2/Launcher			
<i> </i>		Standards Test files	Applications
Test Summary		D.\Users\imv\Documents	Select Folder
Category Rai	ilway Vehicle	History Favorite Folder	
Test Type RA	NDOM	Please select the item on the list and press [Next] button	
		Type File name	Modified
JIS Vet	E 4031:2013 Railway hicle Parts Endurance Test	SINE SWEEP ISO16750-3_2012_Test1_Curve1_20150210	2015/02/10 11:56
Cla INF	iss1A Longitudina FORMATIVE	RANDOM JISE4031_2013_LT_Cat1A_Longitudinal_2015021	0 2015/02/10 12:38
Max. 2.7	650 m/s2 ms	Ť	
			_
Max velocity 3.3	69e-2 m/s rms		_
Max. 0.7 displacement	466 mm rms		
Test time 5:0	0.00		
\$ •		Delete	Next(<u>N</u>) > Close(<u>C</u>)
Test summary	information of th	e selected test	
file is displaye	d. For the test file	e not created	
from 'Standard	ls', only test type	is displayed.	
		The list of test file registered in the 'Fa	vorite' is displayed.

[Delete] : Selected test file can be deleted. Test file itself cannot be deleted.

7.3.3.3.2 Test summary Information Registered to Saved Test File

Similar to 'Folder'. Refer to "Section 7.3.3.1.2".

7.3.3.4 Setting of control channel

In the 'Test files' mode, there are the following three options for control channel setting.

- 1) Use the original setting of the selected test file without modification
- 2) Modify the setting of the selected test file
- 3) Use the top information of the input environment information list

7.3.3.4.1 Use the original setting of the selected test file without modification

Clear the check box of "Change control channel"



The test file saving screen doesn't appear after the button of [Next]is pressed. The selected test file is executed without modification.

7.3.3.4.2 Modify the setting of the selected test file

Check the check box of "Change control channel" and clear the check box of "Select input environment information".

l channel
input environment information
ACCVP32 -
000-Ch1
3.030 pC/(m/s ²)

The first channel of the defined input channels in the selected test file is displayed.

Select the control channel from the displayed input channel list.

The sensitivity of the selected input channel can be changed.

The test file saving screen appears after the button of [Next]is pressed.

All displayed input channels in the list except the selected channel are set to the monitor channel.

<u>When change of the monitor channel setting is needed, open the test file from</u> <u>applications and change the setting.</u>

7.3.3.4.3 Use the top information of the input environment information list

Check the check box of "Change control channel" and check the check box of "Select input environment information".

🛛 Change contro	ol channel
Select fron	n input environment information
	ACCVP32
	000-Ch1
Sensitivity	3.030 pC/(m/s²)

The first channel of the top information registered in the input environment information is displayed.

Select the control channel from the displayed input channel list.

The sensitivity of the selected input channel can NOT be changed. T

The test file saving screen appears after the button of [Next]is pressed.

All defined input channels in the top information except the selected channel as control channel are set to the monitor channel.

When change of the monitor channel setting is needed, open the test file from applications and change the setting.

7.3.4 Quick Help

<Procedures>

If you do not know how to use the Launcher, you can always use the Quick Help to be displayed. When the Quick Help appears, the definition order is displayed in numerics.



<Step 2>

Quick Help appropriate for the screen appears.

In this example, the Quick Help means as shown below.

First, select mode.

Second, select standard.

Third, select list.

Fourth, press the button of [Next].



When any area is clicked on the screen, the Quick Help disappear.

Supplementation) If the operation setting is set to 'Display Guide', the Quick Help is displayed automatically whenever the screen is changed.

7.3.5 Operating Setting 7.3.5.1 Setting Procedures

< Procedures >		
<Step 1 $>$		
Press the	button in the lower left part of the top screen of th	e Launcher.
2/Launcher		
<i> </i>	Standards Test files	Applications
Test Summary	Standard All	
Category Automobile	Find	Clear
Test Type SINE SWEEP	Please select the item on the list and press [Next] button.	
Test condition [Use Conditions] Commercial Car	Type Standard name	^
Engine or Gearbox	RANDOM JIS Z 0232:2004 Packaged Cargo Random Test Reference	BLongitudina
0.5 oct/min	SHOCK JIS E 4031:2013 Railway Vehicle Parts Shock Test Class1A/B	3 Vertical/Transver
[Direction] Each direction	SHOCK JIS E 4031:2013 Railway Vehicle Parts Shock Test Class2 Al SHOCK JIS E 4031:2013 Railway Vehicle Parts Shock Test Class3 Al	I direction
	SINE SWEEP ISO 16750-3:2012 Auto Parts Commercial Car Test 6 Engine// SINE SWEEP ISO 16750-3:2012 Auto Parts Passenger Car Test 3 Flexible F	Gearbox
Max 120.0 m/s2.0-0	SINE SWEEP ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine(A	ll Cylinder)
	SINE SWEEP ISO 16750-3:2012 Auto Parts Passenger Car Test T Engine(5 SINE SWEEP ISO 16750-3:2012 Auto Parts Passenger Car Test 1 Engine(6	≧ Cylinder) ≧ Cylinderr)
Max. velocity 0.2938 m/s 0-p	SINE SWEEP ISO 16750-3:2012 Auto Parts Passenger Car Test 2 Gearbox BANDOM ISO 16750-3:2012 Auto Parts Commercial Car Test 8 Decoup	led Cab
Max. 1.4438 mm p·p displacement	RANDOM ISO 12405-1:2011 Electrically propelled road vehicles Lithur	i-ion batteryTest Pr
	RANDOM ISO 16750-3:2012 Auto Parts Commercial Car Test 6 Engine/0 RANDOM ISO 16750-3:2012 Auto Parts Commercial Car Test 8 Decoup	Jearbox led Cab
Test time 94:00:00	PANDOM ISO 16750-3:2012 Auto Parts Commercial Car Test 7 Unsprun RANDOM ISO 16750-3:2012 Auto Parts Commercial Car Test 8 Decoup	ig Masses led Cab
	· · · · · · · · · · · · · · · · · · ·	
₽	Nex(<u>N</u>) >	Close(<u>C</u>)
× **		
₹ <u> </u>		
< Step 2 >		
Operation sett	ng items appear.	
	✓ Display the guide screen(G)	
	Environment setting(E)	

	Environment setting(E)
	ECO mode maintenance settings(I)
	Select Language(S)
	Application auto-start settings(S)
~	Display License Expiration Warning(A)
	Communication Setting(C)
	K2+ hardware shutdown(D)
	Version Information K2+/Launcher(A)

If any item to be set up is selected, it is checked or unchecked, or the setting screen appears according to the items.

7.3.5.2 Setting Item

(1) Display the guide screen

If it is checked, the Quick Help is displayed automatically whenever the screen is changed.

(2) Environment setting

Information relative to the I/O unit, excitation system rating, and the specifications of sensors generally used can be set up.

For details, refer to "Chapter 3 Setting of K2+".

- (3) ECO mode maintenance settings (Optional)
 The settings relative to ECO option can be set up.
 For details, refer to "5.4 Settings for ECO-option" in Chapter 5.
- (4) Select Language (Optional)

This function is optional. The language to be displayed through the K2+ application can be changed. For details, refer to "4.6 Selecting Languages" in Chapter 4.

(5) Application auto-start settings

When the PC is booted, resident applications are started automatically. This auto-start can be enabled / disabled. For details, refer to "7.3.6 Application auto-start settings" in this chapter.

(6) Display License Expiration Warning (Subscription contract)
 If K2+ was bought at the subscription contract, the warning message is displayed when the expiry is under than 30 days.

It is possible to swich to show or not this message For details, refer to "7.3.7 License Expiry (Subscription contract)" in this chapter.

(7) Communication Setting

Select used K2+ hardware or change the settings. For details, refer to "Chapter 11 Communication with a hardware".

- (8) K2+ hardware shutdown Turn off the power of K2+ hardware to use.
- (9) Version InformationApplication version information appears.

7.3.6 Application auto-start settings

On K2+ system, when the PC is booted, resident applications are started automatically as bellow;



This auto-start can be enabled / disabled.

NOTE) If the setting items described here is changed incorrectly, the system would not work correctly. Please do not change the settings from those set at the shipping from the factory.

<Procedures>

<Step 1>

Press the **button** in the lower left part of the top screen of the Launcher and select "Application auto-start settings" menu.

<Step 2>

The warning message appears. Press "Yes" button to close this message.



<Step 3>

To enable auto-start check the application and to disable uncheck the application. Press "OK" button when changes are completed.

Application auto-start setting	s	×	
Energy Manager	OK 💌		
System Monitor	Cancel		***
Combined Test			
MANUAL Control Box			
CP Server			
Process Watcher			

<Step 4>

Finally, the message appears. Press "OK" button to close this message. Since the next booting of PC, this change will be available.



7.3.7 License Expiry (Subscription contract)

This function is available in the case of the subscription contract.

If K2+ was bought at the subscription contract, the warning message is displayed when the expiry is under than 30 days;

ImvDevVCtrlAppK2Launcher.exe				
This license expires in 7 days. Would you like to upgrade now?				
In the future, do not show me this dialog box	Yes <u>N</u> o			

It is possible to not show this message by checking "In the future, do not show me this dialog box".

And It is possible to not show this or re-show at Set up of Launcher.

<Procedures>

<Step 1>

When want to show the message, press the button in the lower left part of the top screen of the Launcher and check "Display License Expiration Warning" menu.

<Step 2>

When want to not show, uncheck it.

Chapter 8 Condition Check

8.1 Outline

The "Condition Check" application (hereinafter referred to as "this application") is used for the following purposes:

- (1) Diagnoses of dynamic characteristics and aged deterioration of an excitation system and a sensor
- (2) Inspection of input sensitivity of the vibration controller (K2+), and simplified diagnoses of an excitation system and a sensor

Mainly, this application provides the following two functions to execute these diagnoses:

(A) Constant voltage characteristics

This function is used for diagnoses of dynamic characteristics and aged deterioration of an excitation system.

In connection with the excitation system, this application outputs a sine wave of a constant drive level while conducting frequency sweep, to measure frequency characteristics.

This application enables diagnoses of the shaker, amplifier and sensor based on input response levels.

This application also enables diagnosis of aged deterioration of the excitation system by comparing test data with those in the past through continuous measurements.

(B) Input channel characteristics

This function is used for input sensitivity inspection of the vibration controller (K2+) and simplified diagnoses of an excitation system and a sensor.

This application outputs a sine wave of a constant drive level at a fixed frequency, to measure response levels.

With an input channel directly connected to an output channel, this application enables inspection of K2+ input sensitivity.

In connection with the excitation system, this application also enables simplified diagnosis of the excitation system.

<u>CAUTION</u>) When you execute this application with a product or jig mounted on the shaker, use caution. The product or jig may suffer damage depending on output level and frequency. At startup of the Condition Check application, the following window opens. All input channels of the I/O unit are displayed in "Operation status". To close the program, press the close (×) button.

💮 K2+/CONDITIO	N CHECK								🛰
Input Channel	Constant Voltage			⊢ Sensiti	vity				
Characteristics	Characteristics	📕 📕 Keeping t	he current settings	Z A	II channels				
Frequency	5.0 🔶 Hz	<==> 5000	1.0 ≑ Hz		Channel name	Sensitivity	Туре	 Input ur 	nit m∕s² √
Output level	150.0 🜩 mV 0-p			$\mathbf{\nabla}$	000-Ch1 000-Ch2	3.0 pC/(m/s2) 3.0 pC/(m/s2)	1mV/pC		3.0 ← pC/(m/s²) ∨
Output channel 00	0-Ch1 ~				000-Ch3 000-Ch4	3.0 pC/(m/s2) 3.0 pC/(m/s2)	1mV/pC 1mV/pC	Charge	type 1mV/pC ∨
Data storage destina	tion <u>C:\K2Data\IMV</u>				001-Ch1	3.0 pC/(m/s2)	1mV/pC	S	iet to all channels
	<u>Pla</u>	y the quide video			001-Ch3	3.0 pC/(m/s2)	1mV/pC	→ Refe	er Input Environment
				NOT	E: Set the	sensitivity of	the used sense	or correctly	-
0 10 11		0.1001.0	_			,		,	
Operation status	Graph(Monitor)	Graph(Distortion)							
Frequency									
	Acceleration	Velocity	Displacement						
000 Ch1	(m/s² 0-p)	(m/s 0-p)	(mm _{p-p})						
000-Ch2									
000-Ch3									
000-Ch4									
001-Ch1									
001-Ch2									
001-Ch3									
001-Ch4									
001-Ch6									
001-Ch7									
001-Ch8									
002-Ch1									
002-Ch2									
002-Ch3									
002-Ch4									
002-Ch5									
002-Ch7									
002-Ch8									

8.2 Examples of operations

8.2.1 Constant voltage characteristics measurement

<Operating procedure>

This procedure is intended for diagnoses of dynamic characteristics and aged deterioration of the exciting system and sensor.

For details, refer to the guide video.

For the procedure to play the guide video, refer to "8.2.5 Supplementary functions".

<Step 1>

Connect each device, as shown below.





Select "Constant Voltage Characteristics".

🎡 K2/CONDITIO	N CHECK	Ö
Input Channel Characteristics	Constant Voltage Characteristics	
Frequency	5.0 + Hz	<==>

<Step 3>

Specify an input sensitivity.

Select a channel to which a sensor is connected, and specify an input sensitivity.

(The type of sensor applicable to this inspection is acceleration sensor only.)

If you press the "Refer Input Environment Information" button and select input environment information, you can refer to an existing sensitivity setting.

If you uncheck the checkbox in front of a channel name, the relevant channel can be set to be "unused" channel.

Checking the checkbox for "All channels" enables all channels to be changed to be "used" or "unused" at once.

The first channel in used status is the control channel. (In this example, "000-Ch1" is the control channel.)

	Channel name	Sensitivity	Туре	^	Input unit	n∕s² ∨
/	000-Ch1	3.0 pC/(m/s2)	1mV/pC		2,000	-C.// (+2)
/	000-Ch2	3.0 pC/(m/s2)	1mV/pC		2.990	pc/(m/s²) 🗸
/	000-Ch3	3.0 pC/(m/s2)	1mV/pC		Charge tupe	ImV/pC
	000-Ch4	3.0 pC/(m/s2)	1mV/pC		charge type	inivipe v
/	001-Ch1	3.0 pC/(m/s2)	1mV/pC		Set to all c	hannels
	001-Ch2	3.0 pC/(m/s2)	1mV/pC			
/	001-Ch3	3.0 pC/(m/s2)	1mV/pC		Refer Input Er	nvironment
	001 01 4	20.08.10	4.016		Informat	ion

<Step 4>

Specify frequency range and level of a sine wave, and an output channel to be used.

After completion of the above settings, press the start button.

<u>CAUTION</u> The frequency range and level vary depending on the excitation system being connected.When a product or jig is mounted on the excitation system, the product or jig may suffer damage depending on output level and frequency.



<Step 5>

Current measured values are displayed in "Operation status".

"Monitor" graph or "Distortion" graph can be also displayed.



<Step 6>

After completion of the test, save the data.

Specify a file name, and press the [Save] button.

(As the default setting, "year/month/day - hour/minute/second" is specified as file name.)

Data save		\times
Log folder	C:\K2Data\IMV_Data	
File name	20210308-125048	
	Save(S) Cancel	

You can open a folder to save the data, by clicking on the link of "Destination folder".

		Č.	
Data storage destination	on <u>C:\K2Data\IMV</u>	<u>Data</u>	
	<u>Pla</u>	y the quide video	
Send e-mail			
Operation status	Graph(Monitor)	Graph(Distortion)	

```
<Step 7>
```

After the test is completed, you can compare the response data by dragging and dropping an existing data file.



Data subject to view is those for the control channel only.

<Step 8>

To stop or end the test, press the stop button.



<Step 9>

You can check the following conditions based on the measurement results:

- With any channel, no response is displayed in operation status or monitor graph.
 ⇒ It is possible that sensor wire break, connection failure or fault of the sensor has occurred.
- [2] The peak frequency and graph shape are considerably different from data in the past.
 ⇒ It is possible that deterioration of consumable parts or fault of the device has occurred.

8.2.2 Voltage input sensitivity inspection

<Operating procedure>

This procedure is intended for inspection of K2+ voltage input sensitivity.

<Step 1>

Connect the input channel and output channel subject to calibration via the BNC cable, as shown below.



<Step 2>

Select "Input Channel Characteristics".



<Step 3>

Specify an input sensitivity.

For "Input type", select "mV/unit".

In this example, "5 $[mV/m/s^2]$ " is specified.

Press the "Set to all channels" button to set the sensitivity to all channels.

✓ All channels							
	Channel name	Sensitivity	Гуре		Input unit	11/3-	
\checkmark	000-Ch1	3.0 pC/(m/s2)	1mV/pC		2.0		(2)
\checkmark	000-Ch2	3.0 pC/(m/s2)	1mV/pC		3.0	- pc/(ii	/ / /
\checkmark	000-Ch3	3.0 pC/(m/s2)	1mV/pC		Charge tupe	1mV/pC	
\checkmark	000-Ch4	3.0 pC/(m/s2)	1mV/pC		charge (ype	in who	
\checkmark	001-Ch1	3.0 pC/(m/s2)	1mV/pC		🖌 Set to /	all channels	
\checkmark	001-Ch2	3.0 pC/(m/s2)	1mV/pC				
\checkmark	001-Ch3	3.0 pC/(m/s2)	1mV/pC		Refer Inpu	at Environmen	t 👘
-	001-01-4	20.08.10	4 91 6	1	Infor	mation	
ОТ	E: Set the	sensitivity of th	e used sense		ectly		
	E. OOI III O	Sensitivity of a			oony.		



<Step 4>

Specify frequency and level of a sine wave, and an output channel to be used. In this example, "80 [Hz]", "500 [mV]" and "000-Ch1" are specified. After completion of the above settings, press the start button.



<Step 5>

Measured values are displayed in "Operation status". In this example, ideal acceleration value is "100 $[m/s^2]$ ".

To stop the test, press the stop button.



8.2.3 Charge input sensitivity inspection

<Operating procedure>

This procedure is intended for inspection of K2+ charge input sensitivity.

<Step 1>

In the connection status same as that for "Voltage input sensitivity inspection", connect a capacitor to the input channel.



<Step 2>

Select "Input Channel Characteristics".



<Step 3>

Specify an input sensitivity.

For "Input type", select "pC/unit".

In this example, "5 $[pC/m/s^2]$ " is specified.

Press the "Set to all channels" button to set the sensitivity to all channels.

	Channel name	Sensitivity	Туре	^	Input unit <mark>m/s² ~</mark>	
\checkmark	000-Ch1	3.0 pC/(m/s2)	1mV/pC		20 •	
\checkmark	000-Ch2	3.0 pC/(m/s2)	1mV/pC		3.0 PC/(m/s²)	\sim
\checkmark	000-Ch3	3.0 pC/(m/s2)	1mV/pC			
\checkmark	000-Ch4	3.0 pC/(m/s2)	1mV/pC		charge type	
\checkmark	001-Ch1	3.0 pC/(m/s2)	1mV/pC		🖌 Set to all channels	
\checkmark	001-Ch2	3.0 pC/(m/s2)	1mV/pC			
\checkmark	001-Ch3	3.0 pC/(m/s2)	1mV/pC		Refer Input Environment	
-	001 01 4		4.016		information	
NOTE: Set the sensitivity of the used sensor correctly.						

```
<Step 4>
```

Specify frequency and level of a sine wave, and an output channel to be used. In this example, "80 [Hz]", "500 [mV]" and "000-Ch1" are specified. After completion of the above settings, press the start button.



<Step 5>

Measured values are displayed in "Operation status".

In this example, ideal acceleration value is "100*(C/1000) [m/s2]". (C: Capacitance of capacitor [pF]) To stop the test, press the stop button.

	Ö		
	_	Play the quide vide	20
Operation status			
Status	In excitation		
Frequency	80.00 Hz		
	Acceleration (m/s² 0-p)	Velocity (m/s 0-p)	Displacemeı (mm _{p-p})
000-Ch1	166.6667	0.3316	1.3193
000-Ch2	166.6667	0.3316	1.3193
000-Ch3	166.6667	0.3316	1.3193
000-0115			

8.2.4 Simplified diagnosis of the excitation system

<Operating procedure>

This procedure is intended for simplified diagnoses of the exciting system.

For details, refer to the guide video.

For the procedure to play the guide video, refer to "8.2.5 Supplementary functions".

<Step 1>

Connect each device, as shown below.





Select "Input Channel Characteristics".

erístics".	Ċ
K2/CONDITION C	CHECK
Input Channel K Characteristics	Constant Voltage Characteristics
_	E 0 🔺
<Step 3>

Specify an input sensitivity.

Select a channel to which a sensor is connected, and specify an input sensitivity.

(The type of sensor applicable to this diagnosis is acceleration sensor only.)

If you press the "Refer Input Environment Information" button and select input environment information, you can refer to an existing sensitivity setting.

	li channeis						
	Channel name	Sensitivity	Туре	\sim	Input unit	m/s² 🗸 🗸	
\checkmark	000-Ch1	3.0 pC/(m/s2)	1mV/pC		2 000	▲ pC//m/p2)	
\checkmark	000-Ch2	3.0 pC/(m/s2)	1mV/pC		2.550	- pc/(m/s²)	
\checkmark	000-Ch3	3.0 pC/(m/s2)	1mV/pC		Characteria	1mV/pC v	
	000-Ch4	3.0 pC/(m/s2)	1mV/pC		charge type	штурс 🗸	
\checkmark	001-Ch1	3.0 pC/(m/s2)	1mV/pC		Set to a	ll channels	
	001-Ch2	3.0 pC/(m/s2)	1mV/pC				
\checkmark	001-Ch3	3.0 pC/(m/s2)	1mV/pC		Refer Inpu	t Environment	
4	001 01 4	20 CK 10	4 01 6	· ·	Inforr	mation	

<Step 4>

Specify frequency range and level of a sine wave, and an output channel to be used.

After completion of the above settings, press the start button.

<u>CAUTION</u>) The frequency range and level vary depending on the excitation system being <u>connected.When a product or jig is mounted on the excitation system, the product or</u> <u>jig may suffer damage depending on output level and frequency.</u>



<Step 5>

Measured values are displayed in "Operation status".

To stop the test, press the stop button.

	Ö		
		<u>Play the quide v</u> <u>Send e-mail</u>	<u>ideo</u>
Operation status			
Status	In excitation		
E	90 00 H-		
Frequency	00.00112		
Frequency	Acceleration (m/s ² 0-p)	Velocity (m/s _{0-p})	Displacemeı (mm _{PP})
000-Ch1	Acceleration (m/s ² 0-p) 166.6667	Velocity (m/s 0-p) 0.3316	Displacemeı (mm _{p-p}) 1.3193
000-Ch1 000-Ch2	Acceleration (m/s ² 0-p) 166.6667 166.6667	Velocity (m/s 0-p) 0.3316 0.3316	Displacemeı (mm _P -p) 1.3193 1.3193
000-Ch1 000-Ch2 000-Ch3	Acceleration (m/s ² 0 ₋ p) 166.6667 166.6667 166.6667	Velocity (m/s 0-p) 0.3316 0.3316 0.3316	Displacemei (mm _{P-P}) 1.3193 1.3193 1.3193

General diagnosis flow of the excitation system in this example is as follows:



8.2.5 Supplementary functions

(1) Playing the guide video

If you click on the link of "Play the guide video", the screen to select. a video is shown.



Select a video and press [OK] button.

The videos that can be select are different between s "Input Channel Characteristics" and "Constant Voltage Characteristics".

Select a video	×	
Select a video to play.		
Confirming frequency characteristics of products or jigs Confirming frequency characteristics of the excitation system		
		L
OK Cancel		

(2) Sending E-mail

If you click on the link of "Send E-mail", the provided mailer will start.

This function is useful to contact us for information, when you have a problem or other uncertainty about this application.



Chapter 9 Intended Use Judgment Function

9.1 Outline

The intended use judgment function supports customers' compliance. When an operator attempts to start a test likely to be related to military use, the application software alerts the operator. Possibility for military use is judged by three levels of "high, middle, and low".

Alert to an operator is performed only when the judgment result is "high".

Since the judgment result of the possibility for military use is also recorded into Test Record of K2+, it can be checked by customers themselves. For the checking method, refer to the chapter of Test Record.

9.2 Operation Example

9.2.1 Procedures

No special operation procedure is required.

Open a test definition file, and click on Ope. start button.



When any test likely to be related to military use is about to be started, an alert message appears.



To start the test, select "Yes".

The hardware is initialized and proceeded to the excitation start standby status.

If you do not implement any test, select "No".

Then, the system returns to the status of the test definition completed.

Chapter 10 Test Record

10.1 Outline

In the K2+, results of the performed tests are recorded in the test history.

Information to be recorded in the test history is as shown below.

(1) Begin Time:	Time when excitation is started
(2) End Time:	Time when excitation is ended
(3) Application:	Name of application software such as SINE and RANDOM
(4) Type:	Type of tests such as SWEEP and SPOT
(5) Name:	Test file name
(6) End Status:	Status at the end time (Characters are indicated in red in case of abnormal
	end)
(7) Test Time:	Test time or number of excitation times (in the case of SHOCK)
(8) Version:	K2+ software version
(9) Caution:	Result of judgement of intended use (for details, refer to Chapter 9)
(10) Remarks:	Reason for judgment of intended use (in the case of high and middle
	results)

When excitation is ended by each application software, the information is recorded in the test history. Test Record Viewer displays the test history.

In each application software, data files are automatically saved after excitation is ended (*1). Test Record Viewer also displays these data files and the test definition files.

*1 One thousand latest data files are saved in each application software.

The data capacity to be saved is limited to 1 GB. When the data capacity reaches the upper limit, data files are deleted in chronological order before the number of files reaches one thousand.

<Securityfunction>

If you do not want to allow all operators to view the test history, use the security function. The security function checks password when Test Record Viewer is activated. If the input password is wrong, the function prevents Test Record Viewer from being activated.

In the default of the Test Record Viewer, the security function is valid.

As for the cancellation of the security function, refer to the section of "10.3.2 Security Setting".

* Password

We provide a password unique to each of customers. The password cannot be changed by customers themselves.

The password file "Password.txt" is saved in the license installer (Disc1).

The password is described in this file.

Pay close attention to the handling of the password.

10.2 Operation Example

10.2.1 Startup

<Operation example>

<Step 1>

Click on "TEST RECORD" icon of Launcher.

<Step 2>

The password input screen appears.

Password	Х
Input Password	
"Password.txt" described the password is stored in Disc1.	
OK Cancel	

Input the password provided by us.

<Step 3>

When the input password is correct, Test Record Viewer is activated.

🕍 TestRecordViewer								- 🗆	
ile(<u>F)</u> Edit(<u>E)</u> View(V) Option(O) Help	H							
2019 🗸 C									1/1
Begin Time	End Time	Application	Туре	Name	End Status	Test Time	Version	Caution	Remarks
2019/09/10 19:29:57	2019/09/10 19:31:10	SINE	SWEEP	Sweep01_	Excitation is completed. (Test time is comp	0:02:00	14.4.0.0	low	
2019/09/10 19:29:21	2019/09/10 19:29:27	RANDOM	RANDOM	MILSTD-810G_Fig5	Excitation is completed.(Test is aborted by	0:00:00	14.4.0.0	middle	MIL
2019/09/10 19:23:29	2019/09/10 19:27:34	MULTI-SWEE	FDS	MSS_1.0min_	Excitation is completed. (Test is stopped b	0:03:46	14.4.0.0		
2019/09/10 19:19:11	2019/09/10 19:23:18	SINE	SWEEP	Sweep01_1.0min_	Excitation is completed. (Test time is comp	0:04:00	14.4.0.0	low	
2019/09/10 19:18:59	2019/09/10 19:19:00	SHOCK	SHOCK	Shock_レベルスケジュ	Excitation is completed. (Excitation is comp	1	14.4.0.0		
2019/09/10 19:18:36	2019/09/10 19:18:59	SHOCK	SHOCK	Shock_レベルスケジュ	Excitation is completed. (Excitation is comp	20	14.4.0.0		
2019/09/10 19:16:25	2019/09/10 19:18:26	RANDOM	ROR	SMC_ROR_	Excitation is completed. (Test is stopped b	0:01:48	14.4.0.0	middle	SMC
2019/09/10 19:14:16	2019/09/10 19:16:17	BANDOM	ROREX	ROR_Ex_NAVMAT	Excitation is completed. [Test is stopped b	0:01:50	14.4.0.0	middle	NAVMAT
2019/09/10 19:12:07	2019/09/10 19:14:07	MULTI-SWEE	MSP	SOS_	Excitation is completed. (Test is stopped b	0:01:52	14.4.0.0		
2019/09/10 19:10:22	2019/09/10 19:11:57	RANDOM	SOR	ISO16750-3_2012	Excitation is completed.[Test time is compl	0:02:00	14.4.0.0	low	
2019/09/10 19:08:11	2019/09/10 19:10:12	SINE	SPOT	Spot01_	Excitation is completed. (Test is stopped b	0:01:59	14.4.0.0	low	
2019/09/10 19:06:24	2019/09/10 19:08:00	RANDOM	SOR	IS016750-3_2012	Excitation is completed.(Test time is compl	0:02:00	14.4.0.0	low	
2019/09/10 19:04:14	2019/09/10 19:06:15	NON-GAUSSI	NGAUS	Non_Gauss_	Excitation is completed. (Test is stopped b	0:01:00	14.4.0.0		
2019/09/10 19:03:57	2019/09/10 19:04:03	SHOCK	SHOCK	Shock_	Excitation is completed. [Excitation is comp	1	14.4.0.0		
2019/09/10 19:01:47	2019/09/10 19:03:47	RANDOM	RANDOM	MILSTD-810G_Fig5	Excitation is completed. [Test is stopped b	0:00:00	14.4.0.0	high	MILSTD-810G_Fig
2019/09/10 18:53:10	2019/09/10 19:01:37	MULTI-SWEE	FDS	MSS_1.0min_	Excitation is completed. (Test time is comp	0:08:05	14.4.0.0		
2019/09/10 18:48:53	2019/09/10 18:52:59	SINE	SWEEP	Sweep01_1.0min_	Excitation is completed. (Test time is comp	0:04:00	14.4.0.0	low	
2019/09/10 18:48:40	2019/09/10 18:48:41	SHOCK	SHOCK	Shock_レベルスケジュ	Excitation is completed. (Excitation is comp	1	14.4.0.0		
2019/09/10 18:48:17	2019/09/10 18:48:39	SHOCK	SHOCK	Shock_レベルスケジュ	Excitation is completed. (Excitation is comp	20	14.4.0.0		
<									>

10.2.2 Operation on Screen

<General operation on screen>



<Menu for selection in list>

Select and right-click on one of the test results with a mouse. Then, the operation menu appears.

As for each operation menu, refer to "10.2.3 Other Operations".

ion	Туре	Name End Status				Test Time
	SWEEP	Sweep01	_	Excitation is completed. (Tes	t time is comp	0:02:00
М	RANDOM	MILSTD-8		Excitation is completed.(Test	0:00:00	
SWEE	FDS	MSS_1.0	l	Excitation is completed. (Tes	t is stopped b	0:03:46
	SWEEP	Sween01		Excitation is completed. (Tes	t time is comp	0:04:00
	SHOCK	S (Оре	n test definition file(T)	s comp	1
	SHOCK	S (One	n graph data file(G)	s comp	¥Q * * *
М	ROR	S	open graph data me(o) ped b		ped b	0:
М	ROREX	R	Save	graph data file(S)	ped b	0:
SWEE	MSP	SOS_		Excitation is completed. (Tes	t is stopped b	0:01.52
М	SOR	ISO1675	750 Excitation is completed.(Test time is compl			0:02:00

10.2.3 Other Operations

<Open test definition file>

The test definition file of the selected test (test results) can be opened with each application software.

Two types of operating methods are available.

- Select and right-click on any item you want to display with a mouse. Then, the operation menu appears. In the displayed operation menu, select "Open test definition file".
- 2) Select any item you want to display. In the menu bar, select "Edit", then "Open test definition file".

In either operating method, the menu becomes invalid when no applicable test definition file is found.

<Open graph data file>

The data file of the selected test (test results) can be displayed with DataViewer.

Three types of operating methods are available.

- Select and right-click on any item you want to display with a mouse. Then, the operation menu appears. In the displayed operation menu, select "Open graph data file".
- 2) Select any item you want to display. In the menu bar, select "Edit", then "Open graph data file".
- 3) Double-click on any item you want to display.

In the operating method described in 1) and 2) above, the menu becomes invalid when no applicable graph data file is found.

<Save graph data file>

The data file of the selected test (test results) can be saved.

Two types of operating methods are available.

- Select and right-click on any item you want to display with a mouse. Then, the operation menu appears. In the displayed operation menu, select "Save graph data file".
- 2) Select any item you want to display. In the menu bar, select "Edit", then "Save graph data file".

In either operating method, the menu becomes invalid when no applicable graph data file is found.

<Save CSV file>

The displayed test history can be saved in CSV file.

1) In the menu bar, select "File", then "Save CSV file".

10.3 Option 10.3.1 Set Up

Set up	×
Number of display lines per page File retention period	1000 + 100 <= => 1000 10 +
	OK Cancel

<Number of display lines per page>

The number of lines of test results to be displayed per page can be set up.

<File retention period>

The number of years for which test history is saved can be set.

For example, when the number of years is set to ten, the test results in the current year and the past ten years are saved.

10.3.2 SecuritySetting

Whether input password is checked or not at startup of the Test Record Viewer can be set.

Security	\times				
Password input is required at application launch					
(Everyone can access the test record without password security if this item is unchecked)					
OK Cancel					

• To check input password at startup of Test Record Viewer

Tick the checkbox of "Password input is required at application launch". In the default setting, "Password input is performed".

When password check is not required at startup of Test Record Viewer Untick the checkbox of "Password input is required at application launch".
When the checkbox is unticked, the password input screen appears. When the input password is correct, Test Record Viewer can be started up without password input from the next time.Note that all operators can view the test history in this case.

10.3.3 Selection of Column

Select any item to be displayed in the test history.

Customize display item X
Select the displaying items.
Application Type Status End Status Test Time Version Caution Remarks
OK Cancel

Chapter 11 Communication with a hardware

11.1 Outline

In K2+, a computer and a hardware communicate by TCP/IP.

So that, the network setting is necessary.

It is done by K2+ software installed in a computer.

Then it is possible to disconnect or reconnect keeping the test.

[Note] When ECO mode is used, the test is aborted if communication is disconnected.

11.2 Communication setting

<Operation example>

<Step 1>

Select "Communication setting" in Operation setting of Launcher or select "Communication" -

"Communication setting" menu of Menu bar in each K2+ application.

(About Operation setting of Launcher, refer to "7.3.5 Operating Setting")

Communication(C	Option(O)	Help(H)
Communicat	on start(B)	
Communicat	on end(E)	
Communicat	on Setting(S)	

<Step 2>

If that setting has never been set, at first "K2+ hardware setting" screen is appeared.

Press "Search for K2+ hardware" button.

K2+ hardware settir	ng		×	
Network Connection	n (Ethernet : 1	92.168.200.231		
K2+ hardware searc	h		If a compute	er has multiple network
Serial number	IP address	Comment	interface, s	elect the port
			connected t	to K2+ hardware.
		Search for K2+	hardware(<u>D</u>)	
Set value Serial number				*
IP address]
Subnet mask				
Default gateway				
Comment				
Disabled to turn button during in e	off the power by he excitation.	olding POWER		
		Set to K2	+ hardware(<u>S)</u>	
			Close	

<Step 3>

The alarm is shown, so confirm that a computer is connected to only K2+ hardware.

K2+ hard	ware setting	\times
	NOTE: Connect certainly just only K2+ hardware to LAN port of PC. If other devices are connected, there are possibility that any trouble occur. Search for K2+ hardware OK?	
	<u>Y</u> es <u>N</u> o	

<Step 4>

As below, Windows firewall alarm may be appeared.

At that case, check the both Private network and Public network and press "Accept access". Then return <Step 2>.

	💣 Windows Secu	urity Alert		×
	💓 Windo	ws Firewall	l has blocked some features of this app	
	Windows Firewall h	as blocked some	features of K2+/Launcher on all public and private networks.	
	110	Name:	K2+/Launcher	
		Publisher:	IMV Corporation	
		Pat <u>h</u> :	C:\program files\jmv\k2_plus\jmvdevvctrlappk2launcher.exe	
	Allew K2+/Launche	r to communicat	e on these networks:	
	Private netw	orks, such as m	y home or work network	
	Public netwo because the	rks, such as tho se networks ofti	se in airports and coffee shops (not recommended on have little or no security)	
	What are the risks	of allowing an a	pp through a firewall?	ノ
Check both				
l				

<Step 5>

The list of K2+ hardware connected to a LAN port is displayed.

K2+ hardware settin	g	×	
Network Connection	Ethernet : 192.	168.200.231 ~	
- K2+ hardware search	1		
Serial number	IP address	Comment	
001-00-00	192.168.200.232		
		Search for K2+ hardware(D)	
Set value			
Serial number		001-00-00	
IP address		192 . 168 . 200 . 232	
Subnet mask		255 . 255 . 255 . 0	
Default gateway		192 . 168 . 200 . 250	
Comment			***
Disabled to turn o button during in e	ff the power by holdir xcitation.	ng POWER	°́́́́́́́́́́́́́́́́́́
		Set to K2+ hardware(<u>S)</u>	$/ \bigcirc$
		Close	

When change the settings of K2+ hardware (ex. IP address etc.), select the target hardware and input the values.

Then press "Set to K2+ hardware".

Finally press "Close" button.

<Disabled to turn off the power by holding POWER button during in excitation.>

K2+ hardware has the function that power is turned off when the button switch on the front panel is long-pressed.

Usually this function is also available during in excitation.

If this function is to disable to deter the incorrect operation etc., check this item and set to K2+ hardware.

<Step 6>

"Communication Setting" screen is appeared.

Select the used K2+ hardware and press "OK" button.

On the other hand, when update the list of K2+ hardware or change the settings, press "Edit list" button and return <Step 2>.

<Stop the test when a communication error occurs.>

K2+ has the function to keep the excitation if the communication is disconnected by communication failure etc.

If the excitation is aborted at disconnection, check this item.

[Note] When ECO mode is used, this item is checked and not possible to change.

Communication Se	etting		\times
Connection K2+ hard	ware		
Serial number	IP address	Comment	
001-00-00	192.168.200.232		

	<u>ل</u>	_	
	C	く	Edit list(<u>E)</u>
Stop the test whe	n a communication er	TOT OCCUTS.	
		ОК	Cancel

11.3 Operation Example

11.3.1 Test operation start

<Operation example>

<Step 1>

Press "Ope. start" button in Operation tool bar of the each application.

(About "Ope. Start" button, refer to "4.2.3 Description of Icons" or the instruction manual of the each application.)

<Step 2>

The application connects to K2+ hardware and transfers the execution file and the test definition.

And in the case of ECO mode, the system is started up.

Wait until the following "Starting operation" screen is closed automatically.

M Starting opeation		×
Transferring execute files Transferring the test definition		
	Not ECO mode	

M Starting opeation	n	×
Transferring execute files Transferring the test definition Waiting for start		

ECO mode

<Step 3>

After "Starting operation" screen is closed, start the excitation or the acquisition operation.

11.3.2 Communication start/end

At K2+, It is possible to disconnect the communication keeping the excitation and reconnect.

However, Note the following;

- When ECO mode is used, this function is not possible. (If the communication is disconnect, the test is aborted.)
- When "Stop the test when a communication error occurs" of above "Communication setting" is checked, this function is not possible.
- The data during disconnecting is not stored in a file.

<Operation example>

<Step 1>

When disconnecting the communication in test operation, select "Communication" – "Communication end" menu in Menu bar of the each application.

Con	nmunication(C)	Option(O)	Help(H)
	Communication	n start(B)	
	Communication	n end(E)	
	Communication	n Setting(S)	

<Step 2>

When connecting to K2+ hardware in test operation, select "Communication" – "Communication start" menu in Menu bar of the each application.

11.4 Version upgrade

When applications or options are added, not only reinstalling software into the computer but also it is necessary to update the license in K2+ hardware.

< Operation example >

<Step 1>

Reinstall software into the computer according to the separate "Software Installation Instructions" booklet.

<Step 2>

Select "Environment setting" in Operation setting of Launcher or select "Option" – "Environment setting" menu of Menu bar in each K2+ application.

(About Operation setting of Launcher, refer to "7.3.5 Operating Setting")

<Step 3>

Press "License" button.

oquie conrigui	adon information		OK
Module ID 000	Module type 4ch I/O module TYP	E Plus	Cancel
		H	Renew(R
xcitation System SYSTEM	n Information		
			Change(C)
			change(<u>c</u>)
			Lopy[U].
			DeletelD
put Environme	nt Information		
Input Environm	ent Information name	Number of input channel	Add(P)
			Change(<u>H</u>)
			Сору(Ү)

<Step 4>

Confirm the contents of "Update version" and "Current hardware version".

It is impossible to update if "License ID" is different.

If they are correct, press "Update" button.

date version			Current hardware v	ersion	
/ersion	20.0.0.0		Version	20.0.0.0	
icense ID	123456789		License ID	123456789	
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