Proposal of new Riding Quality analysis system !

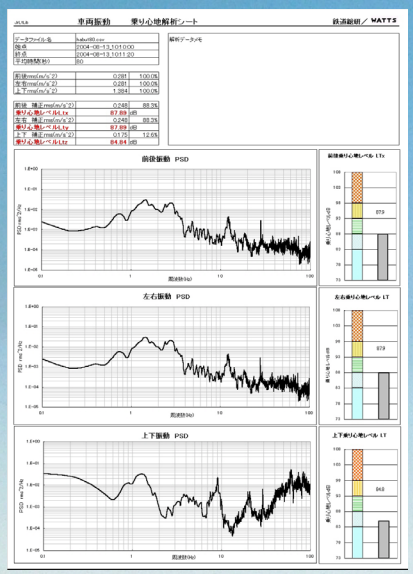
WATTS

Easy operation

Riding Quality Level Analysis. & Spectrum Analysis.　Each software attachment.

DIGITAL ACCELEROMETER／W0031

Riding Quality Level Analysis sheet



○This device connects with WindowsPC by the USB interface and collects data.

○The Riding Quality Level Analysis of the railway vehicle is easily obtained.

The Riding Quality control can be called the basis of the transportation quality for the Passenger Railways Business. Moreovre, the measurement and railway business person's analysis of the vibration acceleration are important in the control. It can be said it is especially indispensable for the receiving check business and the track control business of the vehicle. Then RAILWAY TECHNICAL RESEARCH INSTITUTE did the software package making based on the Riding Quality Level Analysis knowhow which had accumulated up to now. And, an analytical system which was able to use The DIGITAL ACCELEROMETER／compact W0031 and everyone simply was developed. This system receives the license from RAILWAY TECHNICAL RESEARCH INSITUTE by WATTS Limited Company and is doing the manufacturing sales.

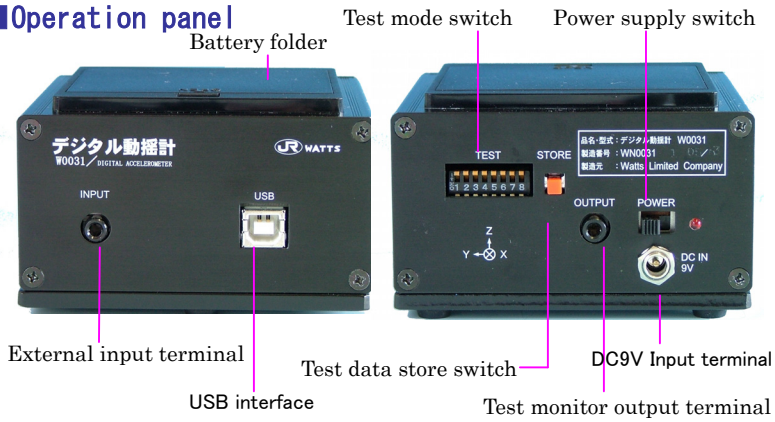
W0031 integrated the three axes acceleration sensor of the silicon piezo resistance type, UM3 dry batteries (4 piece) , the digital signal processing , and the USB interface functions, and achieved the amall size and the low price. All processes from the record to the analysis are done by general purpose WindowsPC. The Riding Quality Level Analysis is output to a fixed from MS-EXCEL work-sheet by the from in accordance with the Riding Quality Level. When a foreign report is made, the user can arrenge a free expression because it is a standard MS-EXCEL file format.

Variou supplementary equipments which support W0031 are abundantly prepared. There is The Marker-Switch ／W0034 to input the sign. There is The Isolation Converter／W0041 which safely inputs speed meter signal of the vehicle. Moreover, there is The GPS-LOGGER ／W0043 which inputs the speed and distance information from the GPS data. In addition, there is The Running-Generator ／W0033 for which three methods of KIROPOST the speed meter, and the GPS data are used properly. The best measurement system for the environment of the site can be selected from these, and it is possible to correspond immediately immediately after the delivery. It is an indispensable, in safety control of the railway vehicle indispensable for examine the safety control of the railway track a new vehicle the trial run a measurement system.

※Windows is a brand name of Microsoft Corporation

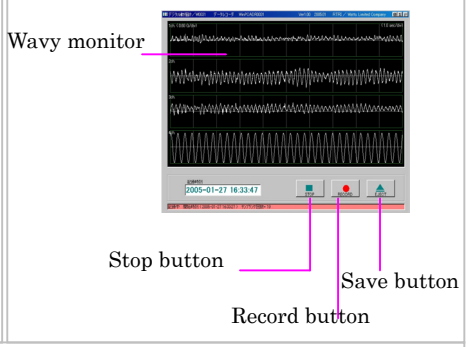
The operation is easy in a simple structure !

■Operation panel

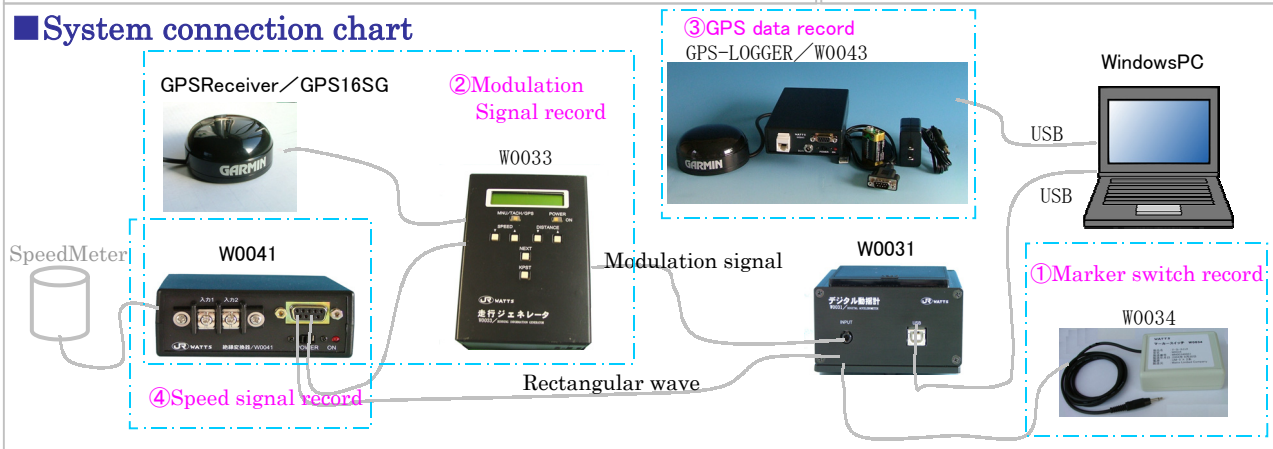


■WindowsPC Display

Data is collected with the DATA RECORDER SOFTWARE of a WindowsPC.



■System connection chart



①The marker is input to the sign with KIROPOST and the structure,etc.
②The user selects from three methods of KIROPOST,the speed signal,and the GPS data,and inputs the speed and distance information.
③The speed and distance information are input by the method of recording the GPS data in parallel by the USB interface
④The speed signal is recorded directly,and the speed and distance information are input.

■Support equipment

●Running Generator／W0033

It is possible to select from three kinds KIROPOST,the speed signal,and the GPS data
Former data is obtained by recovering one's output when analyzing by the mutiple modulation signal of the speed and the distance.

●GPS Receiver／GPS16SG

GPS Receiver Module received from satellite. The cable of 5 m is attached. It is possible to connect directly with W0033. The total extension distance accuracy is about 0.5% on the average.
The speed and the distance can be in real time displayed. It is not possible to use in the no reception section such as long tunnels.

●Marker switch／W0034

Switch Box where handy marker signal is input.
Operates with the battery.
When KIROPOST-MARKER and the structure are passed,this is used.

●Isolation Converter／W0041

When speed meter signal of the vehicle is drawn out,this is used. Receives by high impedance(1MΩ,and does not influence the vehicle.

Moreover,it is safe because it is isolation in electricity.
The machine of dividing frequency can be built into the output signal because of rectangular wave(0-5V) and the clock rate be selected arbitrarily.

●GPS-LOGGER／W0043

The GPS data is recorded directly by USB interface. The vibration data and the speed and distance information are generated based on the GPS reception log file. There is vehicle equipment with merit to obtain speed information regardless. The map tracks in the examination section are obtained with the navigation on market software. GPS can be used the multiplication feelings measurement and to analyze an overseas railway vehicle because it is effective even in foreign countries. However,it is not possible to use in the no reception section such as tunnels.

Abundant analytical software tools !

■Basic data file form

Binary file form ①

data

<Unit acceleration (XYZ)>
4 row CSV=m/s^2、5 row CSV=G

4 row CSV

	A	B	C	D	E
1	5.18E-02	0.120786	0.500398	79.19827	
2	1.73E-02	0.120786	0.448633	79.19853	
3	1.73E-02	0.155296	0.379612	79.1978	
4	0	0.224316	0.603929	79.19707	
5	0	0.155296	0.483143	79.19633	
6	-3.45E-02	0.155296	0.362357	79.1956	
7	0	0.241571	0.534908	79.19487	
8	1.73E-02	0.276082	0.500398	79.19413	
9	-3.45E-02	0.138041	0.362357	79.1934	
10	-3.45E-02	0.189806	0.379612	79.19267	

(F&B)(L&R)(U&D)(Outside)

②

5 row CSV
(speed･distance information addition)

	A	B	C	D	E	F
1	前後(G)	左右(G)	上下(G)	速度(km/h)	距離(km)	
2	0.0053	0.0123	0.0510	79.199	599.978	
3	0.0018	0.0123	0.0457	79.199	599.978	
4	0.0018	0.0158	0.0387	79.198	599.978	
5	0.0000	0.0229	0.0616	79.197	599.978	
6	0.0000	0.0158	0.0493	79.196	599.978	
7	-0.0035	0.0158	0.0370	79.196	599.978	
8	0.0000	0.0246	0.0545	79.195	599.978	
9	0.0018	0.0282	0.0510	79.194	599.978	
10	-0.0035	0.0141	0.0370	79.193	599.978	

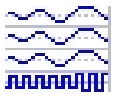
(F&B)(L&R)(U&D)(Speed)(Distance)

Sign	Conversion tool name	Main content	Inclusion package
①	Retrieval／W0031Editor	An arbitrary section is cut out from the binary file of the Data-Recorder. Proofreading correction function of modulation code of The W0033. 4 row CSV are generated.	Standard,attached softpack
②	Shake chart／Dchart	The shake crimp is displayed. An arbitrary section can be generated when The W0033 signal is input and 5 row CSV file be generated.	
	Speed and distance information addition tool／SpeedAdd GPSspeedAdd	5 row CSV file is generated reading the GPS log file when the GPS data is recorded parallel.	
	Speed and distance information addition tool／SpeedAdd TACHspeedAdd	The clock rate is calculated when the speed signal is recorded in an external input and 5 row CSV file is generated.	

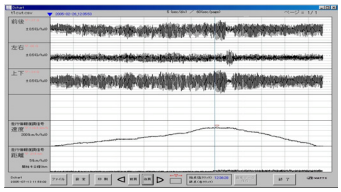
■Analytical software tool

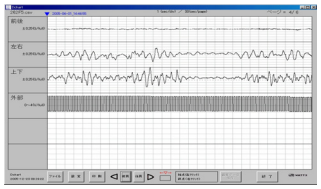
4 row CSV data group

●Shake Chart／Dchart

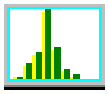


Tool which displays shake chart. The function to recover one's The W0033 modulation signal is possessed,and it is convertible also in as many as 5 row CSV. The time scale and the amplitude span can be switched in the regulated step.





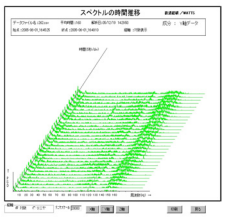
●Riding Quality Level Analysis／JrLtLib



The average Riding Quality Level every 10 seconds is calculated and this software is output to the MS-EXCEL rgulations work-sheet. Rinding Quality Level Analysis and Power Spectrum Density Analysis(PSD) are obtained.

News flash screen display

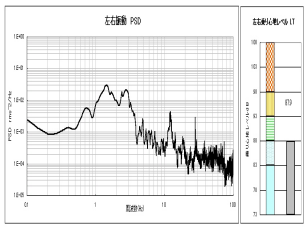
Spectrum transition



Riding Quality Level

MS-EXCEL

Regulations Work-Sheet



●Digital Filter／Dfilter

A suitable filter for railway control (5Hz),regular acceleration (0.5Hz),and vehicle control (20Hz),etc. can be operated. It is effective to a wavy analysis by the shake chart.

●Speed and distance information addition tool／SpeedAdd

Speed information is obtained by inputting the GPS data or The Speed Meter Signal. Moreover,5 row CSV file which adds the speed and distance information is converted

Evaluation examination by which trust is improved !

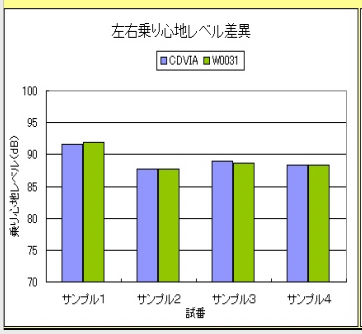
■Reliability evaluation examination

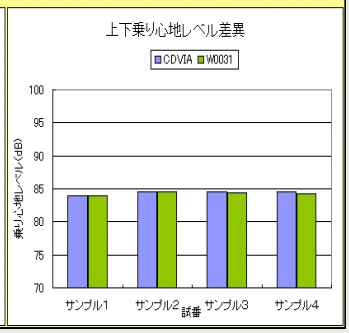
The evaluation examination is executed with the New Vehivle Examination Device(right photograph) in The Railway Technical Research Instite about the evaluation of reliability like maintaining interchangeability with exisiting Riding Quality Analysis Device (CDVIA2360).

Machine difference evaluation examination with existin device.

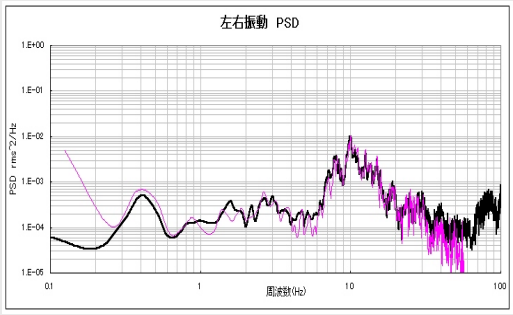
左右	CDVIA	W0031	差異
サンプル1	91.6	91.9	0.3
サンプル2	87.7	87.7	0
サンプル3	88.9	88.7	-0.2
サンプル4	88.3	88.3	0

上下	CDVIA	W0031	差異
サンプル1	84	83.9	-0.1
サンプル2	84.6	84.5	-0.1
サンプル3	84.6	84.4	-0.2
サンプル4	84.5	84.3	-0.2





Vibration spectrum comparison between on the market strain gauge type acceleration sensor and W0031 (Pink:Strain gauge , Black:W0031)



■Main ratings performance (W0031)

Item	Specification	Item	Specification
Acceleration Sensor	3 axis piezo resistance type :333mV/G、±0.5Gfull Frequency band:DC～200Hz Lineality:±1% as follows	Power supply	UM3 dry battery(Alkali type about2hours) ACadaptor DC9V(150mA)
		Size ・ Weight	99.4(W)×100(D)×54.4(H)、 660g
Signal Processing	AD resolution:10bit (±2LSB) Integrated accuracy:1% (1Gfull) Filter belt region:DC～125Hz (-3dB) Sampling rate:409.6Hz／ch (fixation) Number of input channels:4ch(X,Y,Z, External)	Use	Temp.:0℃～40℃、Humidity:20%～80%
		Preservation	Temperature:-20℃～70℃ Neither be dewy nor corrosion gas,etc.
		Vibration	JIS E4031-2B
		Impact	JIS E4032-1A
Interface	USB2.0 conforming (WindowsXp) Data Recorder software:WinPcAdr0031 Temporary file:binary 2byte form Amount of data:4kByte／sec Record time:HDD empty capacity	Attached Goods	Main body(W0031) ・・・・・・・・・・1 peice Alkali battery ・・・・・・・・・・・・・・・4 peice USB cable 2m ・・・・・・・・・・・・・1 peice AC Adaptor・・・・・・・・・・・・・・・・・・1 peice Software package・・・・・・・・・・・・1 set

※The specification changes without a previous notice occasionally.

■Shop

■Manufacturing

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■Development

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