INSTRUCTION MANUAL

Waveform Recording Program

VX-56WR

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Organization of This Manual

This manual describes recording functions, playback functions, and other operation principles of the Waveform Recording Program VX-56WR.
The manual consists of the chapters listed below. You should also consult the documentation for the Tri-axial Groundborne Vibration Meter VM-56.

Outline

Gives basic information on the functions of the VX-56WR.

Installation

Explains about installation of the VX-56WR.

Reading the Display

Explains various items that appear on the display during recording.

Menu Screens

Explains how to use the menus.

Waveform Recording

Explains the steps to take for waveform recording.

Store Data Format and File Structure

Explains the format of stored data and how the files are organized.

Card Capacity and Recording Time

Explains the relationship between rated memory card capacity and recording time.

Communication Commands

Explains additional commands that become available when the waveform recording function is loaded.

Reanalysis with AS-70GV

Explains reanalysis with AS-70GV.

Specifications

Lists the technical specifications of the VX-56WR.

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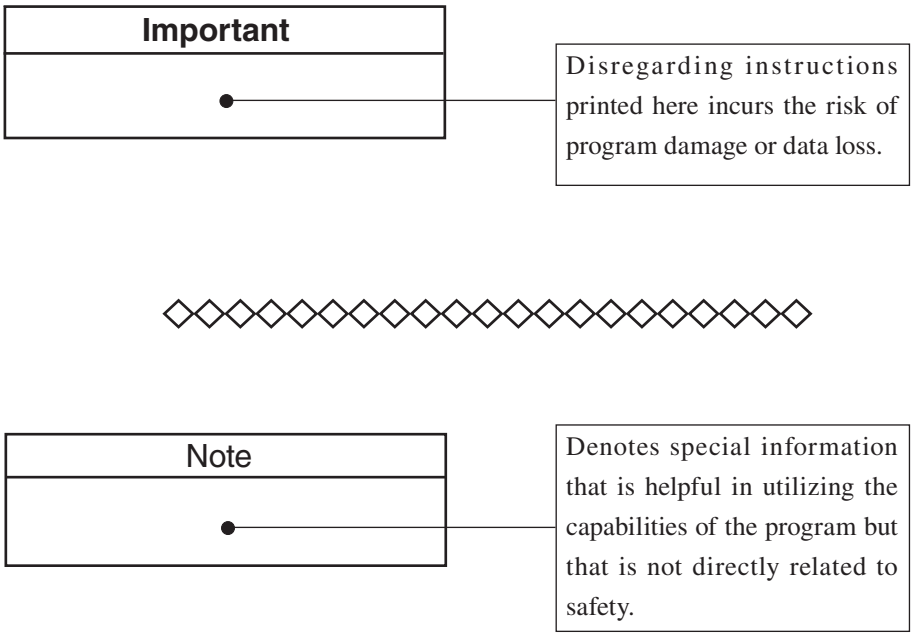
In this manual, important safety instructions are specially marked as shown below. To prevent the risk of severe damage to the program or peripheral equipment, make sure that all instructions are fully understood and observed.



Contents

Outline

The waveform recording program VX-56WR is an option program for adding acceleration waveform recording function to the Tri-axial Groundborne Vibration Meter VM-56 main unit. Acceleration waveform is saved in WAVE format, and recording starts at the same time as measurement. Combined use with waveform analysis software enables 1/3 octave band analysis.

As an outline of the function, the signal input from the acceleration pickup is recorded at a sampling frequency of 2 kHz. Also, it is possible to record the calibration signal output from the VM-56 by switching the input signal. Recording is also started at the same time that the manual store or auto store of the main unit is started, and the recording is also ended at the same time that the store ends.

Important
Use SD memory cards provided by Rion. The performance of other cards is not guaranteed.

Installation

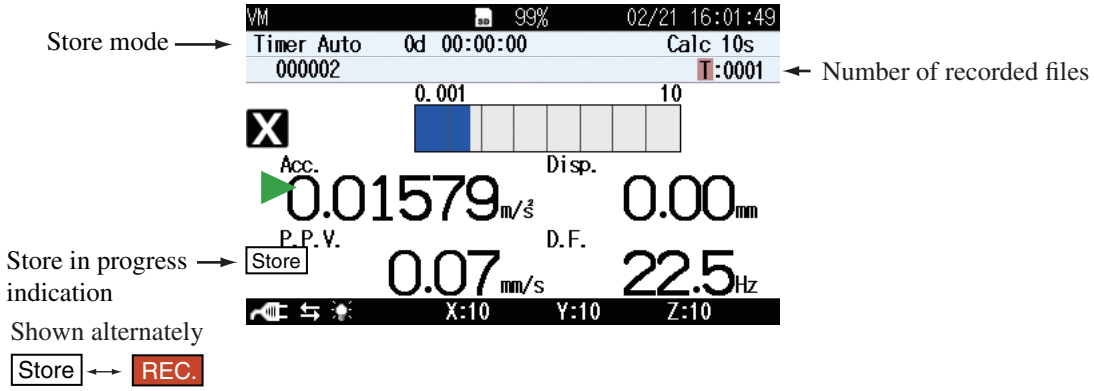
Follow the procedure described in the separate “Optional program installation / uninstallation” to install the VX-56WR program in the VM-56 unit.

Important
Never format the optional program card with SD memory card formatting software (such as SD Formatter etc.). Otherwise the program data on the card will be erased and the respective functions can no longer be used. Restoration of the erased program is not warranted.
Upgrade the firmware of the VM-56 to the latest version before installing the optional program. The latest version firmware can be downloaded from “Software downloads” of Support Room on our web site (http://www.rion.co.jp/english/).

Reading the Display

Recording screen

An illustration of recording screen is shown below.
(The size and font of the actual display may differ.)



Store mode

Shows the selected mode for storing data in memory.

Store in progress indication

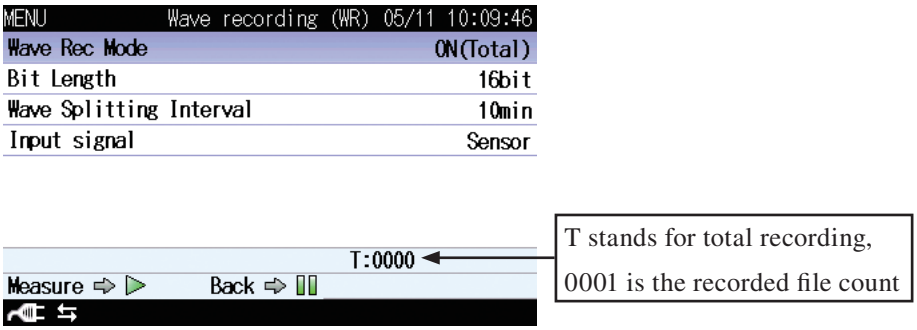
Shows the store condition.

Number of recorded files

Shows the recorded file count.

Menu screen

The menu screen looks as follows.



Wave recording (WR) screen

The recorded file count starts at ST0001.WAV and will stop at the maximum of ST9999.WAV.

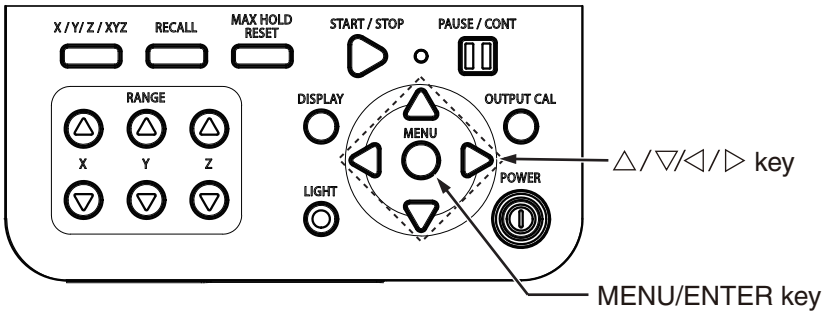
The number shows the sequential number for the file.

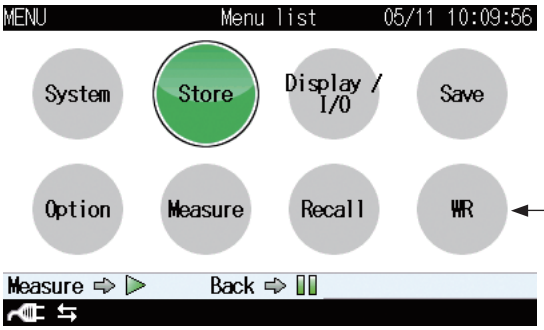
A "0000" file is not created.

Note
The performance about the file after the 10,000th will not be guaranteed.

Menu Screens

Pressing the MENU/ENTER key brings up the menu list screen. Use the △/▽/◁/▷ keys to select [WR] and press the MENU/ENTER key. The wave recording (WR) screen appears. The recording condition is set on this screen.
Each item of the wave recording screen is selected using the △/▽ key.
Pressing the DISPLAY key displays explanation screen of the item that has been selected.
Pressing the PAUSE/CONT key switches back to the menu list screen.
Pressing the START/STOP key switches back to the measurement screen.
As for the wave recording screen, the displayed set item is different depending on the set recording mode.





Menu list screen

Pressing the △/▽/◁ /▷ keys to select [WR] and pressing MENU/ENTER key brings up the [Wave recording (WR)] screen.

Wave recording (WR) screen

Wave Rec Mode

Set the waveform recording mode.

Select [Wave Rec Mode] and press the MENU/ENTER key. The Wave Rec Mode screen appears. Select the recording mode (OFF, ON (Total)) and press the MENU/ENTER key.

If "ON (Total)" is selected, all waveform are recorded from start to finish.

When [Wave Rec Mode] is set to "OFF", waveform recording will not be carried out.

Bit Length

Select the recording data bit length. Increased accuracy of analysis can be obtained as the value increases.

Select [Bit Length] and press the MENU/ENTER key. The Bit Length screen appears. Select the bit length (16bit, 24bit) and press the MENU/ENTER key.

Wave Splitting Interval

Select the size of one file for the entire recording.

Select [Wave Splitting Interval] and press the MENU/ENTER key. The Wave Splitting Interval screen appears. Select the splitting interval (10min, 1h) and press the MENU/ENTER key.

Input signal

Select the signal to be input.

Select [Input signal] and press the MENU/ENTER key. The input signal selection screen appears. Select either [Sensor] or [Cal signal] and press the MENU/ENTER key. If [Cal signal] is selected, the waveform of the calibration signal will be recorded. Normally, you should select [Sensor]. When recording waveform information for the sensor signal, the setting is Fixed acceleration waveform from 0.5 Hz to sensor depending.

Menu list

Wave Rec Mode	OFF, ON (Total)
Bit Length	16bit, 24bit
Wave Splitting Interval	10min, 1h
Input signal	Sensor, Cal signal

Waveform Recording

The VX-56WR provides the Total (total recording) mode.
The Total mode can be used when Auto store (Auto and Timer Auto) or Manual store (Manual) is selected.
Select the appropriate recording function before starting to record.
Verify that an SD memory card with sufficient free space is inserted in the card slot of the VM-56. If no card is inserted, recording cannot be carried out.
For information on how to access and use the setup screen and menus, see the section “Menu Screens”.

The recorded waveform data is saved as the following channel to the WAVE file.

X axis direction: channel 1
Y axis direction: channel 2
Z axis direction: channel 3

Note
After installation is complete, the SD card from which the VX-56WR program was installed can be used as a memory card for storing data.
Prior to measurement, it is recommended first to format the memory card for storing data with this unit.

Total recording

1. Select measurement parameters as described in the “Manual”, “Auto”, and “Timer Auto” sections of the “Store Operation” in the documentation (Instruction Manual) of the VM-56.
2. Access the waveform recording menu screen, set [Wave Rec Mode] to “ON (Total)”, and make appropriate settings for [Bit Length] and [Wave Splitting Interval].

Wave recording screen
(Wave Rec Mode: ON (Total))

3. Press the START/STOP key to return to the measurement screen.
4. Store

4-A. Manual store

Press the START/STOP key to start measurement, and press the START/STOP key again to stop.

To save the measured data and recorded data, select “Store data” on the data save confirmation screen when the measurement is stopped.

During a recording session, the PAUSE/CONT key (PAUSE function) can be used.

4-B. Auto, Timer Auto store

When you press the START/STOP key to start auto store, recording also starts simultaneously.

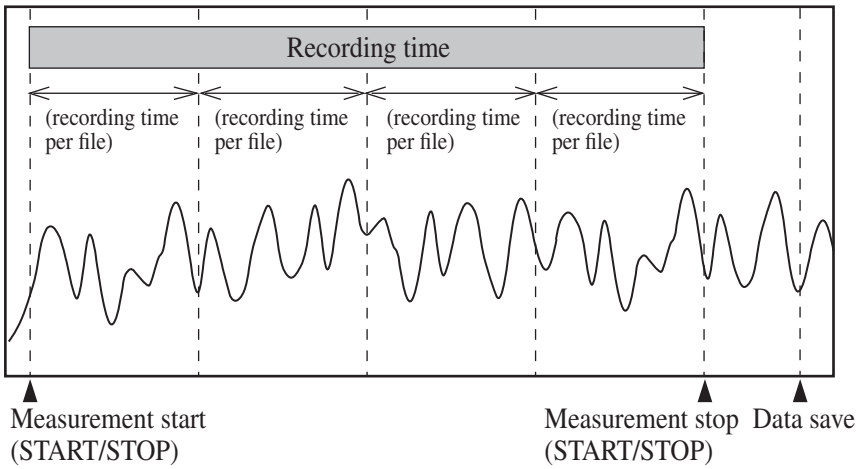
Files are created and saved for each recording period.

To stop recording, press the START/STOP key.

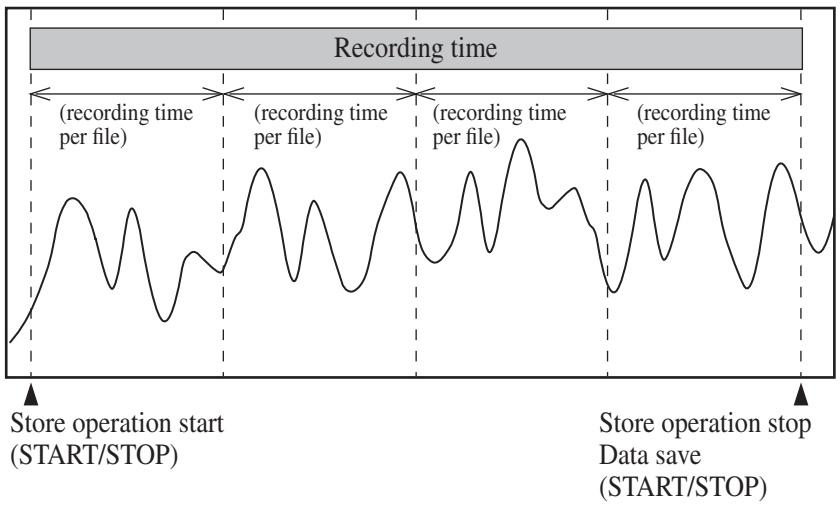
During Auto store, the PAUSE/CONT key (PAUSE function) cannot be used.

The graphs below show the operation principle of total recording.
“Masurement finished” is displayed after measurement is completed. When saving, select “Save data” and push “MENU” key.
“Masurement finished” is displayed after measurement is completed. To save, select “Save data” and push “MENU” key.

Total recording (with manual store)



Total recording (with auto store)



Analysis of recorded files

Recorded files can be analyzed with the Waveform Analysis Software AS-70GV from Rion.

Analysis of recorded information on the VM-56 is not possible.

Store Data Format and File Structure

Folders that are used for saving data differ, depending on the selected store mode.

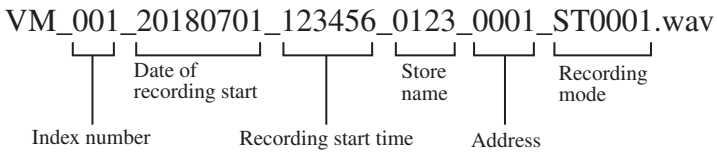
Store destination folder

Files are saved in the sub folder WAVE which is created in the store folder specified by store name.

Example: Manual_0123/WAVE (with manual store)
Auto_0123/WAVE (with auto and timer auto store)

File name of recording data

Recording files are named as shown below.



Store name: 0000 to 9999

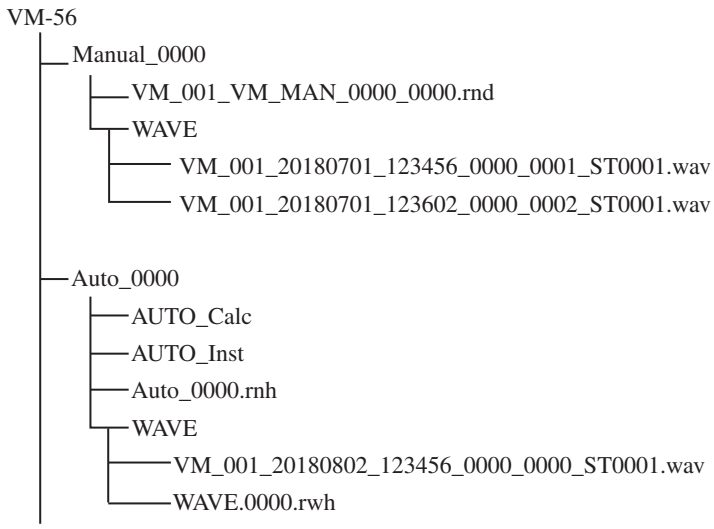
Address: 0000 to 9999 (Auto store is fixed to 0000)

Recording mode: Shown as ST (indicating total recording) followed by the sequential file number

Note
The performance about the file after the 10,000th will not be guaranteed.

When a file with the same name exists in the same directory, it will always be overwritten.

A sample configuration is shown below.



Card Capacity and Recording Time

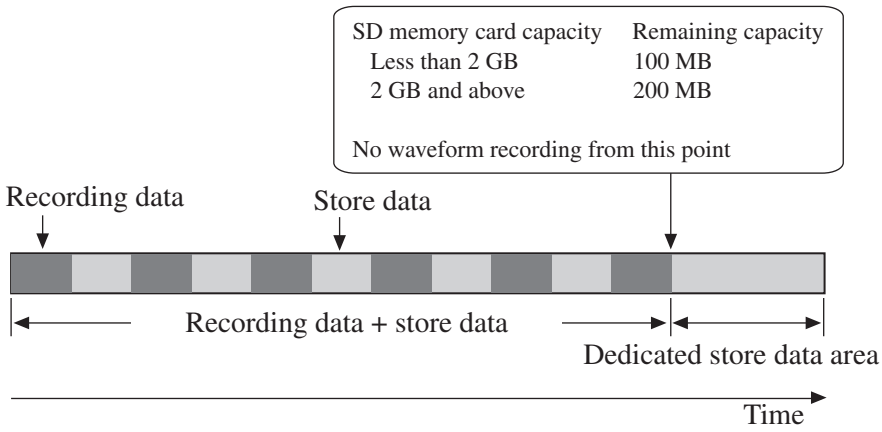
About card capacity and recording time

When saving data on the SD memory card, there are two kinds of storage areas: an area for "recording data (WAVE files) + store data", and an area dedicated to store data only.

When the area for "recording data + store data" becomes full, recording will stop, but only store data will continue to be saved in the area dedicated to store data.

If the capacity of the SD memory card is less than 2 GB, recording will always stop when the remaining capacity reaches 100 MB. After that, only store data will be saved. On SD memory cards with a capacity of 2 GB and above, recording will stop when the remaining capacity reaches 200 MB. After that, only store data will be saved.

The actual size of both store data files and recording files depends on various factors, such as store mode, bit length, and etc. When there are multiple recording data with short recording times, storage space will be wasted and the available time for recording may be up to 20 percent shorter.



Data structure on SD memory card

Approximate recording times for SD memory cards

		SD memory card capacity		
Bit length		512 MB	2 GB	32 GB
	16 bit	Approx. 8 hours	Approx. 32 hours	Approx. 698 hours
	24 bit	Approx. 5 hours	Approx. 22 hours	Approx. 394 hours

Data apply for Auto store, Auto store inst 100 ms

The duration of recording with 24 bit becomes shorter than that with 16 bit because the data volume of 24 bit is about 1.5 times more.

Important

Use SD memory cards with a capacity of 512 MB and above.

Communication Commands

This section lists commands that are added to the Tri-axial Groundborne Vibration Meter VM-56 when the waveform recording function is installed. For information on other commands, please refer to the instruction manual of the VM-56.

List of commands

S: Setting command (for making settings)

R: Request command (for obtaining information on status and measurement results)

Command Description

Wave Rec Mode

Waveform recording mode

Setting waveform recording mode

Setting command	Wave ␣ Rec ␣ Mode, p1
Parameter	p1= “Off”
	p1= “Total”
Request command	Wave ␣ Rec ␣ Mode?
Response data	d1
Returned value	Same as for setting command

Wave Bit Length

Bit length

Setting bit length

Setting command	Wave ␣ Bit ␣ Length, p1
Parameter	p1= “16bit”
	p1= “24bit”
Request command	Wave ␣ Bit ␣ Length?
Response data	d1
Returned value	Same as for setting command

Wave Splitting Interval

File split period

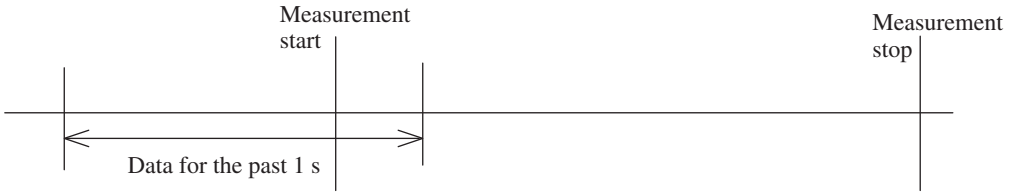
Setting file split period

Setting command	Wave ␣ Splitting ␣ Interval, p1
Parameter	p1= “10m”
	p1= “1h”
Request command	Wave ␣ Splitting ␣ Interval?
Response data	d1
Returned value	Same as for setting command

Reanalysis with AS-70GV

When performing waveform recording with the VX-56WR, start the recording so that the recorded period is a few seconds longer than required. During analysis of the recorded WAV file with AS-70GV etc., the MTVV can only be obtained after the first second has elapsed. The transient response of the filter also has a certain influence, therefore data from a point before the specified period are required for signal processing.

Note
To calculate the MTVV, the VM-56 uses data from one second before the current point. Therefore data from the past one second before the measurement start are required for the first one-second period.
With the VX-56WR, WAV file recording begins from the measurement start point. Therefore MTVV results may differ from the VM-56.



Specifications

Compatible model	Tri-axial Groundborne Vibration Meter VM-56
Media	SD memory card 2 GB
Sampling frequencies	2 kHz
Bit length	24 bit, 16 bit
Data format	WAVE
Frequency weighting	Lower limit 0.5 Hz, Upper limit Sensor dependent
Signal-noise ratio	80 dB and over
Recording functions	
Total recording	Record all time domain waveform during auto store In manual store mode, measurement followed by store operation records the time domain waveform for the entire period of measurement
Parameter settings	
File split interval	
10 minutes, 1 hour	
Number of recorded data	
Auto store	9999 using a single store name
Manual store	144 per address
Battery life	Battery life will be approx. 25% shorter when waveform recording function is used
Dimensions	32 mm (H) × 24 mm (W) × 2.1 mm (D)
Weight	Approx. 5 g

Supplied accessories

Inspection certificate	1

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