SERIAL INTERFACE MANUAL

VIBRATION ANALYZER

VA-11/11B/11C

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Contents

Outline

The VA-11/11B/11C incorporates a serial interface. When a computer is connected via this interface, it can be used to control parameter settings and measurement operation and to receive current measurement data and data stored in the memory of the VA-11/11B/11C.

This manual is divided into four sections covering the following topics.

- Connection to a computer
  Here you will find information about connecting the VA-11/11B/11C to the computer. A cross-wired (null modem) cable is required.

- Transfer principle and transfer procedure
  This section describes the transfer principle and the procedure for sending commands and data.

- Commands
  This section describes the commands that can be sent from a computer to the VA-11/11B/11C. The general format of the commands is shown, followed by a list and a description of the various commands.

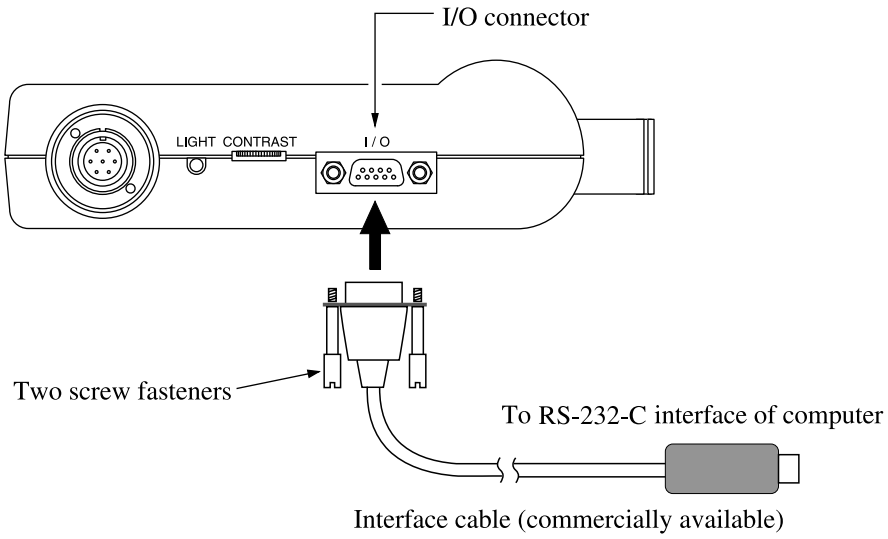
- Output Data Format
  This section describes the format of data output by the VA-11/11B/11C in response to commands. The data include current measurement data and data stored in the memory.

Connection to a Computer

Connect the I/O connector on the side of the VA-11/11B/11C to the RS-232-C interface connector of the computer, using an interface cable as shown below.

I/O connector on VA-11/11B/11C:
9-pin D-sub male connector (also used for printer connection)

Cable type: commercially available cross-wired (null modem) cable



Transfer Principle and Transfer Procedure

Transfer principle

Protocol:	yes
Baud rate:	9600, 19200, 38400 bps
Data word length:	8 bit
Stop bits:	2
Parity:	none
CTS, RTS control:	yes
XON, XOFF control:	no

Transfer procedure

In order to control the VA-11/11B/11C from a computer or to retrieve measurement data, prescribed commands must be sent to the unit. The data exchange must be performed according to certain rules, to ensure that both the VA-11/11B/11C and the computer recognize the commands and data properly.

Control codes

Control codes are 1-byte codes that serve to control the sending and receiving of data blocks. The codes listed below are used.

<CR> Carrier return (control code 0DH)
Moves the cursor to the beginning of a line.

<LF> Line feed (control code 0AH)
Inserts a new line.

<EOT> End of transmission (control code 04H)
Issued by the VA-11/11B/11C when all data blocks of a transmission have been sent. When the computer receives an <EOT> code, it knows that data transmission is completed.

<ACK> Acknowledge (control code 06H)
Issued by the receiving side when a data block was properly received.

<NAK> Not Acknowledge (control code 15H)
Issued by the receiving side when a data block was not properly received.

Transfer protocol

The VA-11/11B/11C uses two types of communication protocols, one for setting commands and one for data request commands.

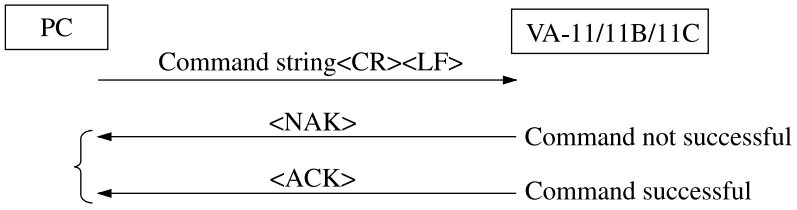
Setting commands

This protocol is used for commands sent from the computer to the VA-11/11B/11C to change settings or control operation. The VA-11/11B/11C issues only an acknowledgment but no further response data to these commands.

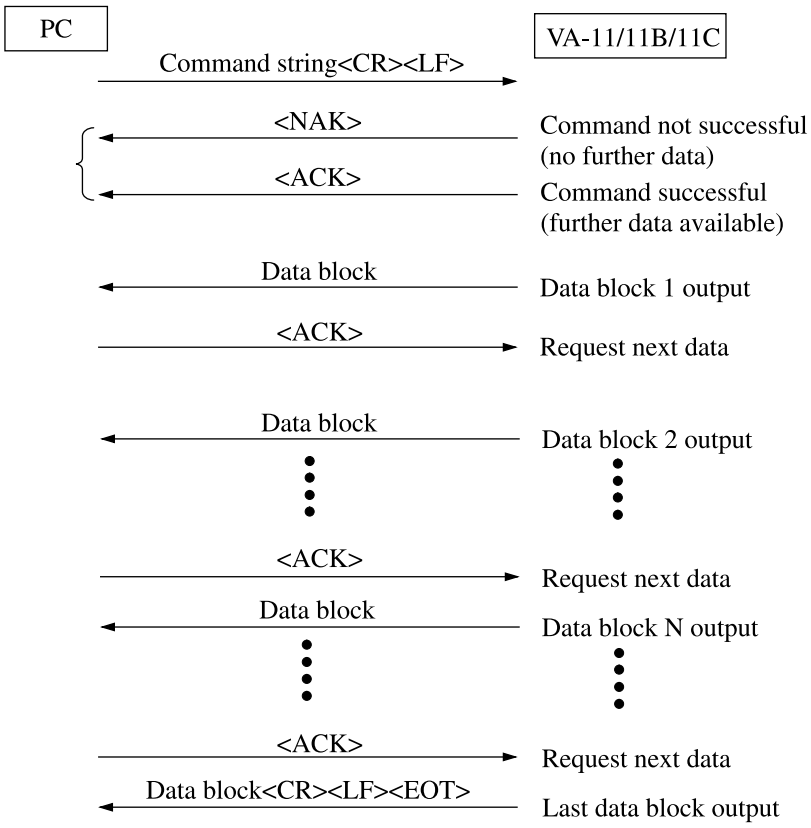
Data request commands

This protocol is used for commands sent from the computer to the VA-11/11B/11C requesting response data.

Setting command



Data request command



Data block content

The VA-11/11B/11C sends out data in blocks of variable length. The maximum length of a block is 256 or 2048 bytes. This is selectable with the BSZ (block size) command.

When the output data length does not exceed one block:

Data 1, data 2, ... data N<CR><LF><EOT>

When the output data length requires several blocks (M data with length K per block):

Data 1, data 2, ... Data K
Data K+1, data K+2, ... Data 2K
Data 2K+1, data 2K+2, ... Data 3K
: : ...
Data (M-1)K+1, Data (M-1)K+2, ... Data (M- 1)K+N<CR><LF><EOT>

Last block length is N (N≤K)

Transfer protocol error

When sending multiple data blocks, after output of one block the VA-11/11B/11C will wait for an <ACK> response from the computer for 10 seconds. If no <ACK> response is received within this period, timeout occurs, the VA-11/11B/11C sends a <NAK>, and transfer is terminated.

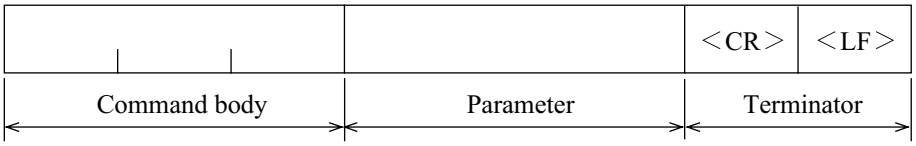
Command error

The VA-11/11B/11C checks whether commands sent from the computer conform to the format and parameter range requirements and whether the command can be currently executed. If an error is detected at this stage, the VA-11/11B/11C returns a <NAK>. The computer can check which type of error has occurred by issuing the EST? command (see page 10).

Commands

Command format

Commands recognized by the VA-11/11B/11C consist of 3 characters (3 bytes) followed by one or more parameters. Command characters use the letters A to Z, and parameters also use numerals 0 to 9 and the question mark.
It is not possible to send several commands together.



Setting commands use one or several numerals. Status inquiry commands use “?”.
In the following explanation, parameters for setting commands are denoted as n1, n2, etc.
The number and range of parameters depends on the command.

- When there are several parameters, they must be separated with spaces. In this documentation, a space (20H) is indicated by an underline “_”.
  <Example>
  DTEn1_n2_n3<CR><LF>
  MRDn1_n2_?<CR><LF>

- A space may also be inserted between the command and the first parameter.
  <Example>
  DTE_n1_n2_n3<CR><LF>

List of Commands

Operation status commands

EST Get error status

VER Get program version

Measurement parameter and operation control commands

RNG Set (Get) range

OVL Get overload status

HPF Set (Get) high-pass filter parameter

LPF Set (Get) low-pass filter parameter

AVR Set (Get) averaging processing parameter

AVN Set (Get) averaging count

SRT Start/end measurement (Get current processing status)

PSE Pause/restart measurement (Get current pause/restart status)

TRG Set (Get) trigger type parameters

TRE Set (Get) pre/post trigger parameter

TRL Set (Get) level trigger parameters

TRP Set (Get) trigger position

FSP Set (Get) frequency span parameter

WIN Set (Get) window parameter

GXE Set (Get) X axis zoom parameter

GXS Shift X axis display data (Get X axis display data shift)

GYE Set (Get) Y axis zoom parameter

GYS Shift display data by 10 × n1 [dB] (Get Y axis display data shift)

GZM Set (Get) zoom ratio

GYL Set (Get) Y scale

GRX Get X axis upper/lower limit

GRY Get Y axis upper/lower limit and unit

CUD Get X axis value and unit, Y axis value and unit at cursor

CPM Set (Get) cursor shift information

CPD Move cursor to reference position

CXU Set (Get) X axis unit for spectrum display

CYU Set (Get) Y axis unit for spectrum display

UNA Set (Get) acceleration unit
UNV Set (Get) velocity unit
UND Set (Get) displacement unit
PKS Set (Get) pickup sensitivity
VYL Set bar graph scale to LIN (linear) scale or LOG scale

RCL Set (Get) operation mode
TIM Set (Get) time
DTE Set (Get) date
SCS Save (Get) measurement parameters
SCL Load (Get) measurement parameters

Display commands

IMD Set (Get) graph display parameter
PLI Set (Get) level list display (highest 10)
VIB Set (Get) data type

Memory commands

MST Set (Get) store type
MSR Control (Get) memory store
MCT Set (Get) number of store data (for timer store)
MSP Set (Get) store interval
MSA Set (Get) store address
MTM Set (Get) timer store status
MSS Set (Get) timer store start time

Data request commands

BSZ Set (Get) output data block size
DOD Get display data in ASCII format
MRD Get memory data in ASCII format

Command Description

Operation status commands

EST ? Get error status

This command obtains the operation status of the VA-11/11B/11C in response to a received command.

Response to EST ?

0: Normal operation
1: Command name error
2: Parameter error
4: Parameter out of range
8: Command cannot be executed in current state

VER ? Get program version

This command obtains the program version.

Response to VER ?

Numeral from 0.1, in steps of 0.1

Measurement parameter and operation control commands

RNG n1 Set range

RNG ? Get range

Values are as shown in the table below.

n1: Number (0 to 5)

n1	0	1	2	3	4	5		
Acceleration	1	3.16	10	31.6	100	316	m/s^2	RMS
Velocity	3.16	10	31.6	100	316	1000	mm/s	RMS
Displacement	0.089	0.283	0.894	2.83	8.94	28.3	mm	EQp-p
	{ 0.032	0.1	0.316	1	3.16	10	mm	RMS }

Response to RNG ?

Corresponding to n1

OVL ? Get overload status

Response to OVL ?

0: Overload has not occurred

1: Overload has occurred

HPF n1 Set high-pass filter parameter

HPF ? Get high-pass filter parameter

n1 = 0: 3 Hz 1: 10 Hz 2: 1 kHz

Response to HPF ?

Corresponding to n1

LPF n1 Set low-pass filter parameter

LPF ? Get low-pass filter parameter

n1 = 0: 1 kHz 1: 5 kHz 2: 20 kHz

Response to LPF ?

Corresponding to n1

AVR n1 Set averaging processing parameter

AVR ? Get averaging processing parameter

n1 = 0: Instantaneous value averaging

1: Linear averaging

2: Exponential averaging

3: Maximum value (peak hold)

Response to AVR ?

Corresponding to n1

AVN n1 Set averaging count

AVN ? Get averaging count

n1: Averaging count (1 to 1023)

Response to AVN ?

Corresponding to n1

SRT n1 Start/end measurement

SRT ? Get current processing status

n1 = 0: End measurement 1: Start measurement

Response to SRT ?

0: Measurement ended (Linear averaging, peak hold)

1: Measurement in progress

2: Trigger standby

PSE n1 Pause/restart measurement

PSE ? Get current pause/restart status

n1 = 0: Pause measurement 1: Restart measurement

Response to PSE ?

0: Measurement paused

1: Measurement not paused

TRG n1 n2 Set trigger type parameters

TRG ? Get trigger type parameters

n1: Mode (0: Free-run 1: Repeat 2: Single)

n2: Source (0: Level trigger 1: External trigger)

Response to TRG ?

Corresponding to n1, n2

TRE n1 Set pre/post trigger parameter

TRE ? Get pre/post trigger parameter

n1 = 0: Turn off pre/post trigger function

n1 = 1: Turn on pre-trigger

n1 = 2: Turn on post-trigger

Response to TRE?

Corresponding to n1

TRL n1 n2 Set level trigger parameters
TRL ? Get level trigger parameters
Trigger level (±n1/8) Default value (n1 = +2)
n1: Trigger level (-7 to +7)
n2: Slope (0: -, 1:+)
Response to TRL ?
Corresponding to n1, n2

TRP n1 Set trigger position
TRP ? Get trigger position
n1: Trigger position (0, 16, 32, 48, ... 240) Default value (=0)
Response to TRP ?
Corresponding to n1

FSP n1 Set frequency span parameter
FSP ? Get frequency span parameter
n1 = 0: 100 Hz
1: 200 Hz
2: 500 Hz
3: 1 kHz
4: 2 kHz
5: 5 kHz
6: 10 kHz
7: 20 kHz
Response to FSP ?
Corresponding to n1

WIN n1 Set window parameter
WIN ? Get window parameter
n1 = 0: Rectangular 1: Hanning 2: Flat-top
Response to WIN ?
Corresponding to n1

GXE n1 Set X axis zoom parameter (possible when zoom ratio (GZM) is set to 2 or higher, see page 15)

GXE ? Get X axis zoom parameter

n1 = 0: ×1 1: ×2 2: ×4 3: ×8

Response to GXE ?

Corresponding to n1

GXS n1 Shift X axis display data

GXS ? Get X axis display data shift

When X axis zoom is set to ×2 or higher, band data can be shifted towards the left edge of the frame with this command (using left edge 0 as reference).

When X axis zoom is ×2: n1 = shift amount (0 to 5)

When X axis zoom is ×4: n1 = shift amount (0 to 15)

When X axis zoom is ×8: n1 = shift amount (0 to 35)

Response to GXS ?

Corresponding to n1

GYE n1 Set Y axis zoom parameter

GYE ? Get Y axis zoom parameter

When Y axis scale is dB

n1 = 0: ×1 1: ×2 2: ×4

When Y axis scale is Linear

Zoom ratio = full scale/(2n1) n1: Scale (0 to 10)

Response to GYE ?

Corresponding to n1

GYS n1 Shift display data by 10 × n1 [dB] (related to Y axis [dB] zoom setting)

GYS ? Get Y axis display data shift

When zoom is ×2: n1 = shift amount (0 to 4)

When zoom is ×4: n1 = shift amount (0 to 6)

Response to GYS ?

Corresponding to n1

GZM n1 Set zoom ratio

GZM ? Get zoom ratio

n1 = 0: ×1 1: ×2 2: ×4 3: ×8

Response to GZM ?

Corresponding to n1

GYL n1 Set Y scale

GYL ? Get Y scale

n1 = 0: dB 1: Linear

Response to GYL ?

Corresponding to n1

GRX ? Get X axis upper/lower limit

Response to GRX ?

n1 = X axis upper limit

n2 = X axis lower limit

GRY ? Get Y axis upper/lower limit and unit

Response to GRY ?

n1 = Y axis upper limit

n2 = Y axis lower limit

n3 = 0: G

1: m/s^2

2: mm/s

3: inch/s

4: mm

5: mils

6: dB

CUD ? Get X axis value and unit, Y axis value and unit at cursor

Response to CUD ?

n1 = X axis value at cursor

n2 = X axis unit at cursor (string indicated by cursor on screen)

n3 = Y axis value at cursor

n4 = Y axis unit at cursor (0 to 6 below)

0: G

1: m/s^2

2: mm/s

3: inch/s

4: mm

5: mils

6: dB

CPM n1 Set cursor shift information

CPM ? Get cursor shift information

n1 = 0: Right 1: Left

Response to CPM ?

Numerical indication of right-direction shift, using left edge as reference

When display is set to spectrum

n1: Shift amount (0 to 101)

When display is set to time waveform

n1: Shift amount (0 to 127)

CPD Move cursor to reference position

Moves the cursor to the left edge of the frame.

CXU n1 Set X axis unit for spectrum display

CXU ? Get X axis unit for spectrum display

n1 = 0: Hz 1: KCPM 2: ORDER

Response to CXU ?

Corresponding to n1

CYU n1 Set Y axis unit for spectrum display

CYU ? Get Y axis unit for spectrum display

n1 = 0: dB 1: Linear

Response to CYU ?

Corresponding to n1

UNA n1 Set acceleration unit

UNA ? Get acceleration unit

n1 = 0: m/s^2 1: G

Response to UNA ?

Corresponding to n1

UNV n1 Set velocity unit

UNV ? Get velocity unit

n1 = 0: mm/s 1: inch/s

Response to UNV ?

Corresponding to n1

UND n1 Set displacement unit

UND ? Get displacement unit

n1 = 0: mm 1: mils

Response to UND ?

Corresponding to n1

PKS n1 n2 Set pickup sensitivity

PKS ? Get pickup sensitivity

Pickup sensitivity = numeral × multiplication factor [mV/ms^{-2}]

n1: Numeral (100 to 999) Default value (510 × 0.01)

n2: Multiplication factor (0: ×0.1 1: ×0.01 2: ×0.001)

Response to PKS ?

Corresponding to n1, n2

RCL n1 Set operation mode

RCL ? Get operation mode

n1 = 0: Set measurement mode 1: Set recall mode

Response to RCL ?

Corresponding to n1

TIM n1 n2 Set time

TIM ? Get time

Sets the time for the built-in clock of the VA-11/11B/11C.

n1: Hours (0 to 23 in 24-hour notation)

n2: Minutes (0 to 59)

Response to TIM ?

Corresponding to n1, n2

DTE n1 n2 n3 Set date

DTE ? Get date

Sets the date for the built-in clock of the VA-11/11B/11C.

n1: Day (1 to 31)

n2: Month (1 to 12)

n3: Year (0 to 99, last two digits)

Response to DTE ?

Corresponding to n1, n2, n3

SCS n1 Save measurement parameters

SCS ? Get saved measurement parameters

n1: Address (1 to 10)

Response to SCS ?

All saved measurement parameter sets are output, in the order address 1, address 2, ... address 10.

When saved, clock information is output as follows:

YY/MM/DD___HH:mm

3 spaces

YY: last two digits of year

MM: month

DD: day
HH: hours
mm: minutes

When not saved, clock information is output as follows:

- NONE - _____

8 spaces

SCL n1 Load measurement parameters

SCL ? Get saved measurement parameters

n1: Address (1 to 10) (0: default state)

Response to SCL ?

All saved measurement parameter sets are output, in the order address 1, address 2, ... address 10.

When saved, clock information is output as follows:

YY/MM/DD___HH:mm

3 spaces

When not saved, clock information is output as follows:

- NONE - _____

8 spaces

VYL n1 Set bar graph scale

n1=0: LOG scale 1: LIN (linear) scale

Display commands

IMD n1 Set graph display parameter

IMD ? Get graph display parameter

n1 = 0: Vibration meter display
1: Spectrum display
2: Time waveform

Response to IMD ?

Corresponding to n1

PLI n1 Set level list display (highest 10)

PLI ? Get level list display setting

n1 = 0: List display off
1: List display on

Response to PLI ?

0: List display turned off

1: List display turned on

VIB n1 Set data type

VIB ? Get data type

This command serves for setting the data type to be shown on the display.

n1 = 0: Acceleration
1: Velocity
2: Displacement
3: Acceleration envelope

Response to VIB ?

Corresponding to n1

Memory commands

MST n1 Set store type

MST ? Get store type

n1 = 0: Manual store 1: Transient store

Response to MST ?

Corresponding to n1

MSR n1 Control memory store

MSR ? Get memory store status

n1 = 0: Stop store 1: Start store 2: Clear Memory

Response to MSR ?

0: Store not activated

1: Store in progress (transient store, timer store)

2: Store standby (timer store)

MCT n1 Set number of store data (for timer store)

MCT ? Get number of store data

n1: Data number (1 to 500)

Response to MCT ?

Corresponding to n1

MSP n1 Set store interval

MSP ? Get store interval

(** [minutes]) in minutes (2 digits)

n1: Minutes (1 to 60)

Response to MSP ?

Corresponding to n1

MSA n1 Set store address

MSA ? Get store address

Serves to set the address for storing data.

n1: Address (1 to 500)

Response to MSA ?

Corresponding to n1

MTM n1 Set timer store status
MTM ? Get timer store status
n1 = 0: Timer store not activated
1: Timer store activated

MSS n1 n2 Set timer store start time
MSS ? Get timer store start time
n1: Hours (0 to 23 in 24-hour notation)
n2: Minutes (0 to 59)
Response to MSS ?
Corresponding to n1, n2

Data request commands

BSZ n1 Set output data block size
BSZ ? Get output data block size
Serves to select the maximum block size for data transfer.
n1: Data size (0: 256 bytes 1: 2048 bytes)
Response to BSZ ?
Corresponding to n1

DOD ? Get display data in ASCII format
Serves to read the level of the displayed data.
(When spectrum display is activated, the unit depends on the Y axis cursor unit.)
For information on data contents, see page 23.

MRD n1 n2 ? Get memory data in ASCII format
Serves to read the level of data stored in memory.
n1: Memory address (1 to 500)
n2: Number of data to read
(When spectrum display is activated, the unit depends on the Y axis scale.)
For information on data contents, see page 25.

Output Data Format

This section explains the format of the data output by the VA-11/11B/11C in response to the DOD and MRD commands.

Data structure

In the indication of data format, □ signifies a numeral and ■ a decimal point. Data are delimited by commas.

(1) Linear type ±□.□□□E±□□
Mantissa Exponent (mantissa × 10^exponent)
(2) dB type ±□□□.□
(3) Vibration meter mode crest factor □□.□□
(4) Overload indication □ (0: No overload 1: Overload)
(5) Spectrum list frequency □■■■□

Output data in response to DOD ?

Vibration meter

(1), (1), (3), (1), (1), (4)<CR><LF><EOT>
Acceleration rms value, peak value, crest factor, velocity, displacement, overload information

Time waveform

(1), (1), ... (1), (4)<CR><LF><EOT>
Data 1, data 2, ... data 128, overload information

Note
When zoom is set to ×2 or higher, 128 data are output as screen display data

Spectrum

When Y axis cursor unit is linear

(1), (1), ... (1), (4)<CR><LF><EOT>

When Y axis cursor unit is dB

(2), (2), ... (2), (4)<CR><LF><EOT>

Data 1, data 2, ... data 102, overload information

Note
When zoom is set to ×2 or higher, 102 data are output as screen display data

Spectrum list

When Y axis cursor unit is linear

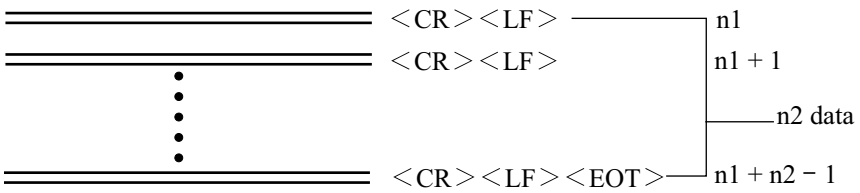
“AP”, (1), (5), (1), ... (5), (1), (4)<CR><LF><EOT>

When Y axis cursor unit is dB

“AP”, (2), (5), (2), ... (5), (2), (4)<CR><LF><EOT>

“AP”, level, frequency 1, level 1, ..., frequency 9, level 9, overload information

Output data in response to MRD n1 n2 ?



Data are shown sequentially, starting from memory address n1, to memory address n1 + n2 -1 data

n2 data are output. The data content is as follows.

n1: Output start address

n2: Number of data

Note
When there are addresses without data in the specified address range, only <CR><LF> is output.

Data contents at each address

[Position]	[Sample data]	[Description]	[Bytes]
0000	“VA-11”	Keyword	5
0005	“, ”	Comma	1
0006	“Ver 1.00”	Version number	8
0014	“, ”	Comma	1
0015	“01”	File type[1]	2
0017	“, ”	Comma	1
0018	“YYYY:MM:DD”	Measurement date	10
0028	“, ”	Comma	1
0029	“HH:MM”	Time	5
0034	“, ”	Comma	1
0035	“Measurement parameters”	Measurement parameters[2]	255
0290	“, ”	Comma	1
0291	“*****”	Number of measurement data bytes	5
0296	“, ”	Comma	1
0297	Analysis result	Measurement data[3]	L
0297+L	<CR><LF>		2

File type[1]: See section “1. File Type”
Measurement parameters[2]: See section “2. Measurement Parameters”
Measurement data[3]: See section “3. Measurement Data”

1. File Type
   00: Not used
   01: Standard memory (manual store)
   02: Standard memory (timer measurement)
   03: Transient store

2. Measurement Parameters

Common settings for vibration meter and analyzer

Measurement data type

Measurement data type:	0: Acceleration	1: Velocity	
	2: Displacement	3: Envelope	
Acceleration unit:	0: m/s^2	1: G	
Velocity unit:	0: mm/s	1: inch/s	
Displacement unit:	0: mm	1: mils	

Analysis mode:	0: Vibration meter	1: Spectrum	2: Time waveform
Input range:	0: minimum -	5: maximum	
Pickup sensitivity:	mV/ms^{-2} (numeral, multiplication factor)		
Numeral:	***: 100 to 999		
Multiplication factor:	100: ×0.1	010: ×0.01	001: ×0.001
High-pass filter:	0: 3 Hz	1: 10 Hz	2: 1 kHz
Low-pass filter:	0: 1 kHz	1: 5 kHz	2: 20 kHz
Timer store	0: OFF	1: ON	
Time:	HH:MM in 24-hour notation		
Store interval	MM in minutes (2 digits)		
Store count	***: 001 to 500		

Analyzer settings

Reserved space:	12 bytes
Zoom ratio:	0: ×1 1: ×2 2: ×4 3: ×8
Time window:	0: Rectangular 1: Hanning 2: Flat-top
Frequency span:	0 to 7: 100 Hz to 20 kHz
Trigger operation:	0: Free-run 1: Repeat 2: Single
Trigger source :	0: Level trigger 1: External trigger
Trigger position:	±****: ± four-digit numeral
Level trigger position:	-7 to +7: -7/8 to +7/8
Level trigger slope:	0: - 1: +
Averaging type:	0: Instantaneous value 1: Linear averaging
	2: Exponential averaging 3: Maximum value
Averaging count	****: 0001 to 1023

Spectrum display conditions

X axis shift count:	**: 00 to 35
Y axis scale:	0: dB 1: Linear
Y axis zoom (dB):	0: ×1 1: ×2 2: ×4
Y axis zoom (Linear):	**: 00 to 10
Y axis level shift (dB):	**: 00 to 80
Cursor X axis unit:	0: Hz 1: KCPM 2: ORDER
Cursor Y axis unit:	0: dB 1: Linear
Top ten peak list display:	0: OFF 1: ON
Cursor position, from left:	***: 000 to 101

Time waveform display conditions

X axis zoom:	0: ×1 1: ×2 2: ×4 3: ×8
X axis shift count:	**: 00 to 35
Y axis zoom:	**: 00 to 10
Cursor position, from left:	***: 000 to 127

Reserved space:	0 display
Reserved space:	001 display
Reserved space:	16 bytes
Overload information:	0: No overload 1: Overload
Vibration meter bar graph scale:	1 byte
Reserved space:	114 bytes

Measurement parameter data example

[Position]	[Sample data]	[Description]	[Bytes]
Common settings for vibration meter and analyzer			
0000	“0”	Measurement data type	1
0001	“, ”	Comma	1
0002	“0”	Acceleration unit	1
0003	“, ”	Comma	1
0004	“1”	Velocity unit	1
0005	“, ”	Comma	1
0006	“1”	Displacement unit	1
0007	“, ”	Comma	1
0008	“1”	Analysis mode	1
0009	“, ”	Comma	1
0010	“3”	Input range	1
0011	“, ”	Comma	1
0012	“510.010”	Pickup sensitivity	7
0019	“, ”	Comma	1
0020	“0”	High-pass filter	1
0021	“, ”	Comma	1
0022	“2”	Low-pass filter	1
0023	“, ”	Comma	1
0024	“1”	Timer store	1
0025	“, ”	Comma	1
0026	“13:52”	Timer store time	5
0031	“, ”	Comma	1
0032	“15”	Timer store interval	2
0034	“, ”	Comma	1
0035	“135”	Timer store count	3
0038	“, ”	Comma	1
0039	“ ”	Reserved space	12
0051	“, ”	Comma	1

Analyzer settings

0052	“0”	Zoom ratio	1
0053	“, “	Comma	1
0054	“1”	Time window	1
0055	“, “	Comma	1
0056	“7”	Frequency span	1
0057	“, “	Comma	1
0058	“0”	Trigger operation	1
0059	“, “	Comma	1
0060	“0”	Trigger source	1
0061	“, “	Comma	1
0062	“-0012”	Trigger position	5
0067	“, “	Comma	1
0068	“-5”	Level trigger position	2
0070	“, “	Comma	1
0071	“1”	Level trigger slope	1
0072	“, “	Comma	1
0073	“1”	Averaging type	1
0074	“, “	Comma	1
0075	“0102”	Averaging count	4
0079	“, “	Comma	1
0080	“24”	Spectrum X axis shift count	2
0082	“, “	Comma	1
0083	“1”	Spectrum Y axis scale	1
0084	“, “	Comma	1
0085	“2”	Spectrum Y axis zoom (dB)	1
0086	“, “	Comma	1
0087	“05”	Spectrum Y axis zoom (Linear)	2
0089	“, “	Comma	1
0090	“24”	Spectrum Y axis shift (dB)	2
0092	“, “	Comma	1
0093	“0”	Spectrum cursor X axis unit	1
0094	“, “	Comma	1
0095	“0”	Spectrum cursor Y axis unit	1

0096	“, “	Comma	1
0097	“0”	Spectrum list display	1
0098	“, “	Comma	1
0099	“025”	Spectrum cursor position	3
0102	“, “	Comma	1
0103	“4”	Time waveform X axis zoom	1
0104	“, “	Comma	1
0105	“17”	Time waveform X axis shift count	2
0107	“, “	Comma	1
0108	“09”	Time waveform Y axis zoom	2
0110	“, “	Comma	1
0111	“105”	Time waveform cursor position	3
0114	“, “	Comma	1
0115	“0”	Reserved space	1
0116	“, “	Comma	1
0117	“001”	Reserved space	3
0120	“, “	Comma	1
0121	“ ”	Reserved space	16
0137	“, “	Comma	1
0138	“1”	Overload information	1
0139	“, “	Comma	1
0140	“1”	Vibration meter bar graph scale	1
0141	“, “	Comma	1
0142	“ ”	Overall extra space	114

3. Measurement Data

Vibration meter mode

(1), (1), (3), (1), (1)<CR><LF><EOT>

Acceleration rms value, peak value, crest factor, velocity, displacement

Time waveform

(1), (1), ... (1)<CR><LF><EOT>

Data 1, data 2, ... data 128

Spectrum

When Y axis unit was linear at store point

(1), (1), ... (1)<CR><LF><EOT>

When Y axis unit was dB at store point

(2), (2), ... (2)<CR><LF><EOT>

Data 1, data 2, ... data 102

Sample Program

Sample program

This section contains a sample program that uses the MRD command to transfer data from the VA-11/11B/11C to the computer. (When wishing to use the DOD command, the “MRD” part can be replaced by “DOD ?”.)

The sample program is written in Visual Basic 4.0 (32 bit). The following tools were used:

- Command Button
- Text Box
- Common Dialog
- MSComm32 (for custom control reference,
  C:\WINDOWS\SYSTEM\MSCOMM32.OCX is added)

Program contents

First, MSCOMM settings are made. Then the BSZ command is used to select the data block size, and the MRD command is used to obtain memory data which are then written to a file.

```
   Private Sub Command1_Click ()
   Dim M!, File1$, Filen1$, FileT$, Pausetime%, Start&
‘--------------Communication settings  ----------------------------------------------
   With MSComm1
      .CommPort = 1                    ‘Use COM1
      .Settings = “9600,N,8,2”    ‘9600 bps, no parity, data word length 8 bits,
                                  2 stop bits
      .InBufferSize = 4096         ‘Buffer size 4096
      .InputLen = 0                ‘Read entire buffer
      .RTSEnable = True            ‘Enable RTS line
      .PortOpen = True             ‘Open port
   End With
‘-------------------------------------------------------------------------------------
   MSComm1.Output = “BSZ1”+ Chr$(13) + Chr$(10)
                                   ‘Send command “BSZ 1”
   For M = 1 To 300000: Next M       ‘Wait
   File1 = MSComm1.Input        ‘Receive response (ACK or NAK)

   MSComm1.Output = “MRD 1  3  ?”+ Chr$(13) + Chr$(10)
                                   ‘Send command “MRD 1 3 ?”
   Text1.Text =“Sending data!”

‘---------------Wait (3 seconds)-----------------------------------------------------
   Line1: Pausetime = 3            ‘Set pause time
      Start = Timer                ‘Set pause start time
      Do While Timer < Start + Pausetime
         DoEvents                  ‘Hand control to other events
      Loop
‘-------------------------------------------------------------------------------------
      File1 = MSComm1.Input          ‘Receive response (measurement data)
      FileT = FileT + File1
      If AscB(Mid(File1, Len(File1), 1)) = 4 Then
                                     ‘Check for EOT(04H)
         Text1.Text =  “Sending data completed!”
```

```
        '------------File write  ------------------------------------------------------
        CommonDialog1.Filter="TXT file (*.TXT) | *.TXT"
        CommonDialog1.filename ="*.TXT"
        CommonDialog1.ShowOpen
        Filen1 = CommonDialog1.filename
        Open Filen1 For Output As #1              'Open file
        Print #1, FileT                           'Write file
        Close #1
'-------------------------------------------------------------------------------------------
        MsgBox "File write completed!"
        End
    Else
      MSComm1.Output = Chr$(6)          'Send ACK(06H)
      File1 = " "
      GoTo Line1
    End If
End Sub
```

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