



Android Terminal Application

Chart Viewer

Operating Instructions

(Ver 1. 3. 2)



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<NOTE> This document is translated from Japanese to English by Google-Translate.

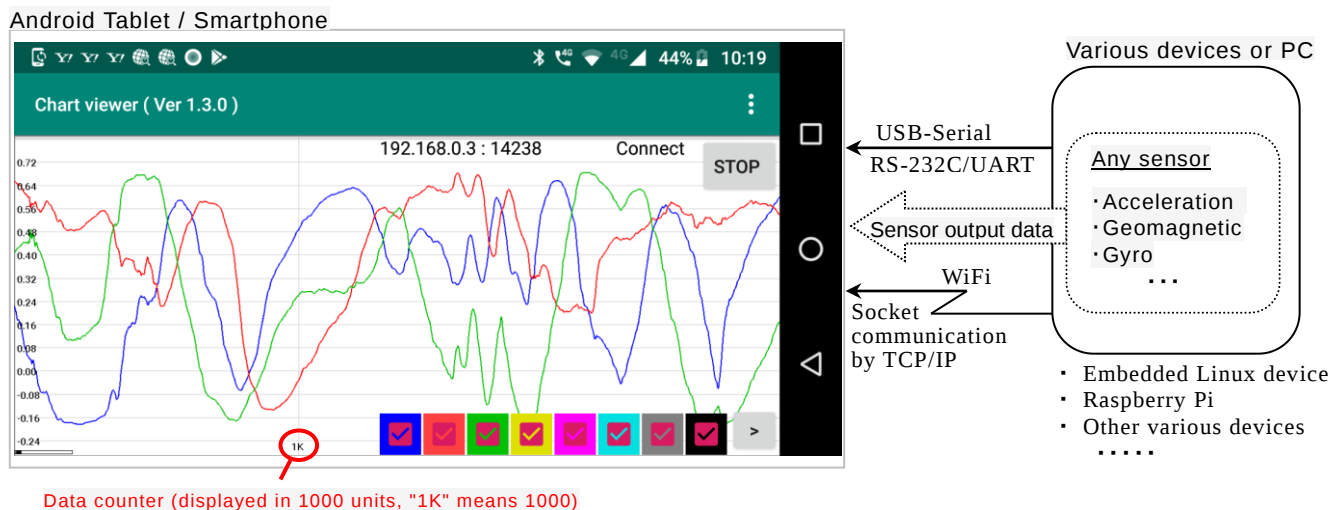
Please refer to "http://www.ne.jp/asahi/ajara/kojara/data/android_chartview_j.pdf" for the Japanese version of the original.



1. Summary

This software is an ANDROID terminal application that displays data charts in real time. Receives data from various devices and personal computers and displays the waveform. Each connected device or personal computer must have a function to transmit data such as sensor output. Various devices can be connected via serial line (RS-232C / UART) and WiFi (socket (TCP / IP)). The numerical value is extracted from the received data, and a chart (waveform graph) is displayed in real time like an oscilloscope.

Display example of time chart (waveform graph)



As received data, text data in CSV format and transparent packet frames (binary data delimited by DLE / STX to DLE / ETX) can be handled.

Text data recognizes one set(1 to 8ch) of data per line. The end of the text data line is CR (0x0D), LF (0x0A), or 2 bytes of CR+LF.

Text data is CSV format text separated by comma (,) and contains the numeric values of specified by the number of data items(number of channels).

For example, text data storing three integers of 123.456, 124.567, -10.789 is as follows.

Data with three items(three channels)

123.456, 124.567, -10.789	LF(0x10)
---------------------------	----------

Text data can be filtered to select only specific lines by specifying the character string included in the text data.

To select only the following text data lines, set "[PKT-A]" in "Set filter string" from the action menu.

(In this case, the value following "[PKT-A]" is evaluated)

[PKT-A] 123.456, 124.567, -10.789	LF(0x10)
-----------------------------------	----------

If special string exists before the numerical value, set that string in "Set string in before values".

If the following text data line, Set "Value =" .

..... Value = 123.456, 124.567, -10.789	LF(0x10)
---	----------



A transparent packet frame is a byte stream that starts with DLE - STX and ends with DLE - ETX.

Packet frame

DLE	STX	Packet data	DLE	ETX
-----	-----	-------------	-----	-----

 (STX = 0x02, ETX = 0x03, DLE = 0x10 fixed)

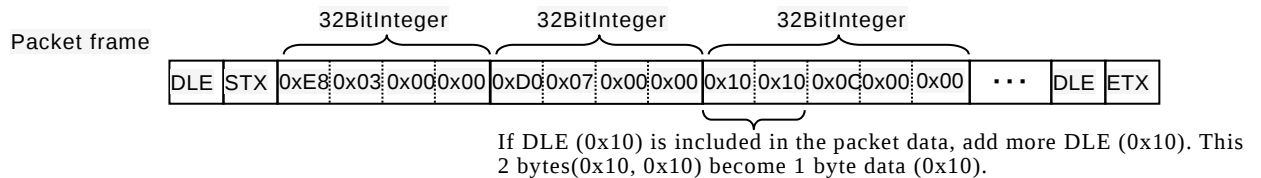
When receiving data, two consecutive DLEs in the packet data are converted to one DLE.

(In other words, if you want to include a byte with the same value as DLE in the packet data, insert one DLE, convert it to DLE / DLE 2 bytes, and send it.)

The packet data is a little-endian 32-bit integer whose number is specified by the number of data items(number of channels).

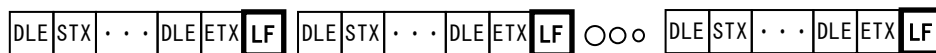
This values must be specified left-justified. (Values are treated as signed integers)

For example, a packet frame storing three integers of 1000 (0x03E8), 2000 (0x07D0), and 3088 (0x0C10) is as follows.



For transparent packet frames, you cannot filter the data or specify the location of the data.

<Note> When transmitting a transparent packet frame in Socket mode, add LF (0x0A) to the end of each packet.



2. ANDROID Version

ChartViewer can be used on Android Ver4.2.2 or later.

3. Supported serial communication devices

The ChartViewer supports the following three serial communication USB devices made by the RATOC-SYSTEM.

#	Name	USB connector shape
1	REX-USB60MB	Micro-B
2	REX-USB60MI	Micro-A
3	REX-USB60F	Type A (Usual PC USB connector)

4. processing power

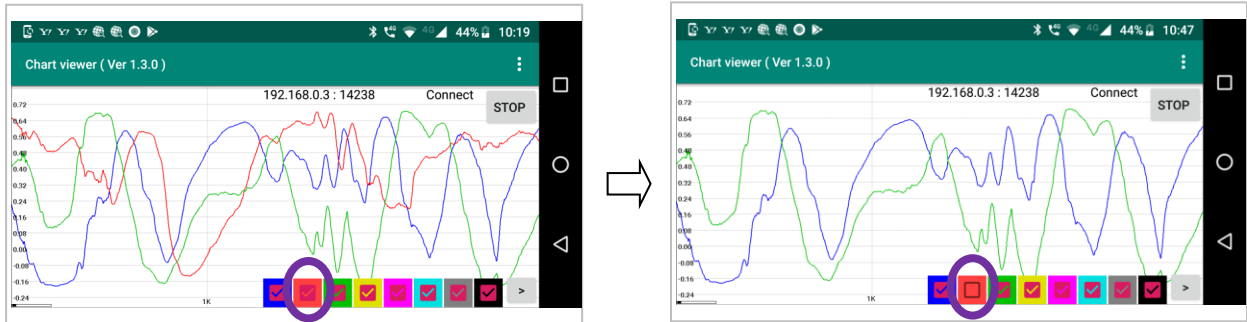
The Chartviewer is created with java (interpreter), so it is not possible to display a chart at an extremely high sampling rate. Sampling rate is depends on the features of your Android device, such as a tablet.

About 10 to 100 ms for text data, about 5 to 50 ms for binary data(transparent packet frame) .



5. Filter the chart display

Check boxes at the bottom right of the screen allow you to select the data items to be displayed on the screen.
(In the following example, the red waveform is hidden by turning off the red check box.)



You can also show / hide the checkbox itself by tapping the **>** button to the right of the checkbox.

6. Pausing and scrolling

Tap the **STOP** button at the top right of the screen to stop displaying the chart. (At this time, the button display changes to **START**.)
While the display is stopped, the chart can be scrolled by dragging in the horizontal direction.

The gauge at the bottom left of the screen shows the status of the data stored in the buffer.



The buffer capacity is 20,000 data (fixed).

To resume displaying the chart, tap the **START** button.

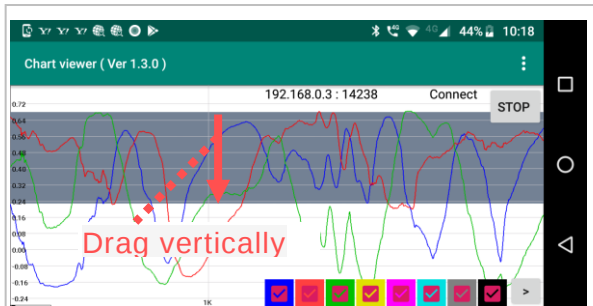


7. Range setting by drag operation

By dragging the screen vertically, the dragged area can be enlarged and displayed.

At this time, the range you dragged is set as the range, and the automatic-range mode is canceled.

Tapping the screen will (again) enter autorange mode.



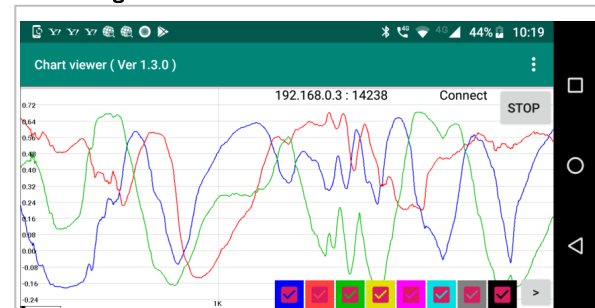
drag

Zoom in on dragged area



tap

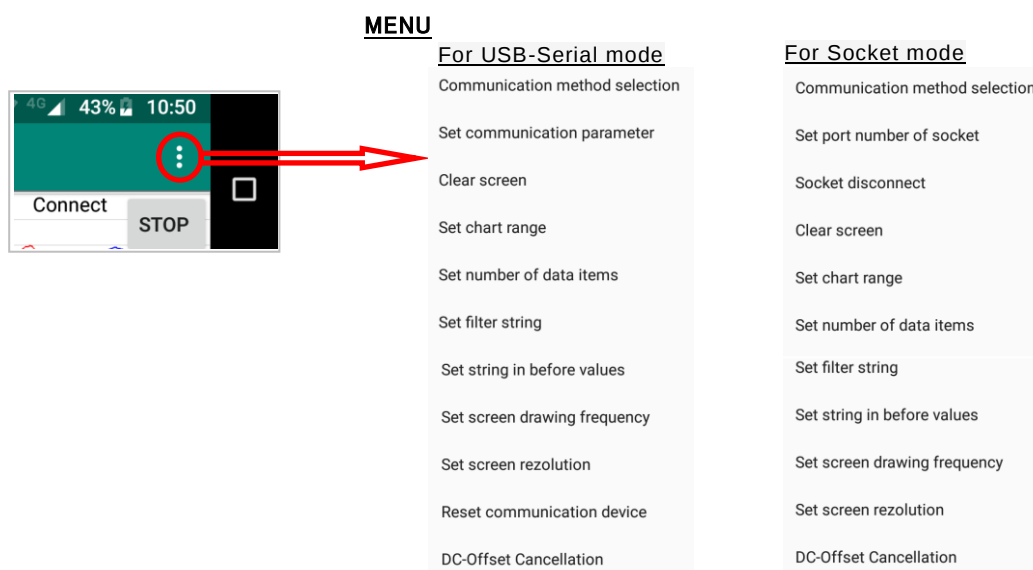
Auto range mode





8. Action bar menu

Tap  at the right end of the title bar to display the following menu.



Make the following settings in each menu.

MENU	CONTENT
Communication method selection	Select USB-Serial mode / Socket mode. If the mode changes, restart the app.
Set communication parameter	Set the communication speed, number of data bits, number of stop bits, parity, flow control type
Set port number of socket	Set the port number for socket communication. (Default = 14238)
Socket disconnect	Close the socket and disconnect from the client.
Clear screen	Clear the screen.
Set chart range	Set the range value (low value and high value) of the chart graph.
Set number of data items	Set the number of data items (number of channels, number of simultaneously displayed waveforms).
Set filter string	Set the filtering character string of the received text data.
Set string in before values	Set the character string located immediately before the numeric value of the received text data.
Set screen drawing frequency	Screen update frequency (Specify how many times data is received before updating the chart)
Set screen resolution	Select the screen resolution (number of horizontal and vertical pixels).
Reset communication device	Reset the serial communication device and clear the screen.
DC-offset Cancellation	Adjust so that the area of the positive side of the waveform is the same as the area of the negative side.



8.1. Selection of communication method (USB-Serial / Socket)

Select USB-Serial mode or Socket mode.
If the mode changes, restart the app.

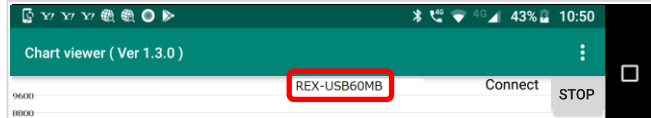
Communication method selection

☒ USB-Serial (REX-USB60xx)

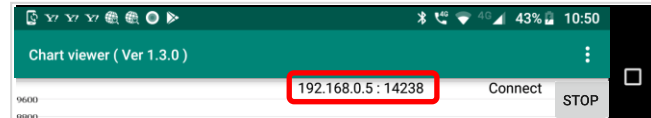
☐ LAN (Socket)

CANCEL OK

* The mode can be identified by the display at the top of the screen



In USB-Serial mode, the name of the connected device is displayed. However, it is hidden if not connected.



In Socket mode, the IP address and port number are always displayed.

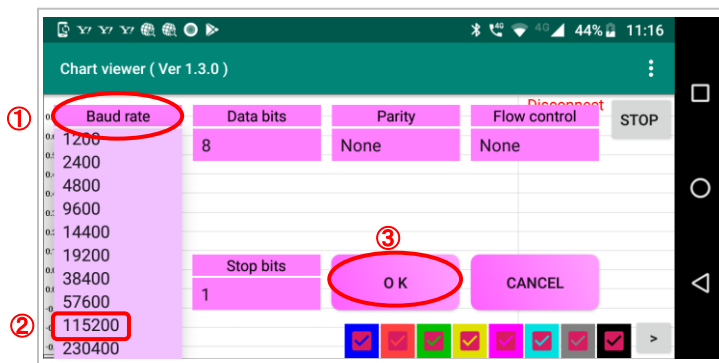
8.2. Setting communication parameters

Set the communication parameters (communication speed, number of data bits, number of stop bits, parity bits, flow control) in USB-Serial mode.

The screen shown below is displayed. Tap the orange setting item to expand the item menu.

Tap the value to set and tap the OK button.

For example, to set the communication speed to 115200bps, tap “Baud rate” and then tap “115200”.



8.3. Set port number of socket

Set the port number for Socket communication. (The default value is 14238)

Set port number of socket

14238

CANCEL OK

8.4. Disconnect Socket

Close the socket and disconnect from the client.

Disconnect instantly when selecting a menu.

8.5. Clear screen

Clear the screen.

Clear screen instantly when selecting a menu.



8.6. Set chart range

The range (low value and high value) of the chart diagram is automatic-range-mode set by default, and is automatically set according to the data value.

If you want to set the range of the chart diagram fixedly, uncheck "Range setting automatically" in the "Set chart range" menu and set the range value.

In the case of automatic range setting, the maximum and minimum values obtained from the received data are obtained, and the range is set by adding a 10% margin above and below.

If you tap the "OK" button with "Range setting automatically" checked in the "Set chart range" menu, it will be in the automatic-range-mode. (The range is calculated from the maximum and minimum values of the data currently in the buffer.)

Set chart range

Range high
0.80947

Range low
-0.29657

☒ Range setting automatically

CANCEL OK

To set a fixed range, tap to remove the check.

8.7. Set number of data items

Set the number of data items (number of channels, number of waveforms displayed simultaneously on the chart).

Set number of data items

☐ 1

☐ 2

☒ 3

☐ 4

☐ 5

☐ 6

☐ 7

☐ 8

CANCEL OK



8.8. Set filter string

Specify the character string (filter string) included in the valid text line when text data (line by line) is received.

For example, if you specify {"[PKT-A]"} as the filter string, only the lines that contain the string "[PKT-A]" in the received text line will be valid, and the other text lines will be ignored.

Set filter string

[PKT-A]

CANCEL OK

Received text

[PKT-A] 0.04883, -0.05762, 0.65894,	→ Valid line
[PKT-B] 0.04858, -0.05737, 0.65918,	→ X
[PKT-C] 0.04883, -0.05737, 0.65942,	→ X
[PKT-A] 0.04810, -0.05664, 0.65991,	→ Valid line
[PKT-B] 0.04858, -0.05664, 0.66089,	→ X
[PKT-C] 0.04883, -0.05713, 0.66089,	→ X
.....	

8.9. Set string in before values

Specifies the string that immediately precedes the numeric values, if the numeric values is not the beginning of a received text line (or if it is not immediately after a filter string).

Set string in before values

Value=

CANCEL OK

Received text

Value= 0.04883, -0.05762, 0.65894,	
Value= 0.04858, -0.05737, 0.65918,	
Value= 0.04883, -0.05737, 0.65942,	
Value= 0.04810, -0.05664, 0.65991,	
Value= 0.04858, -0.05664, 0.66089,	
Value= 0.04883, -0.05713, 0.66089,	
.....	

8.10. Set screen update frequency

Set the drawing frequency of the chart diagram (how many times data is received before updating the chart diagram).

The default value is "1", which updates the chart diagram each time data is received.

Set screen drawing frequency

1

CANCEL OK



8.11. Set screen resolution

Select the screen resolution to be set.

Set screen rezolution

☒ 100%(1332 * 720)

☐ 80%(1065 * 576)

☐ 60%(799 * 432)

☐ 40%(532 * 288)

☐ 20%(266 * 144)

CANCEL OK

* Actual resolution value differs depending on each device.

8.12. DC-Offset Cancellation

Adjust the offset of the waveform data so that the areas of the positive and negative values of the displayed waveform are the same.

Select "DC-Offset Cancellation" from the action bar menu to display the following dialog box.

DC-Offset cancellation

☐ Enable DC-Offset cancellation

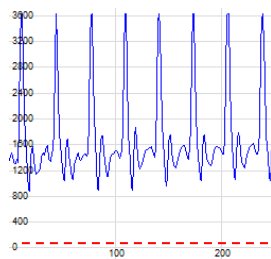
Number of data which offset cancellation

100

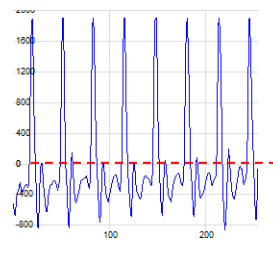
The timing which renews offset value

CANCEL OK

No DC offset cancellation

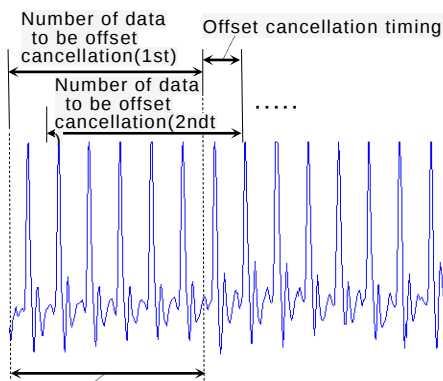


With DC offset cancellation



Here, set the following values and tap OK.

Enable DC-Offset cancellation	Check to perform DC offset cancellation
Number of data which offset cancellation	Specify the number of data for DC offset correction.
The timing which renews offset value	Specify the timing to update the DC offset correction value by the number of data

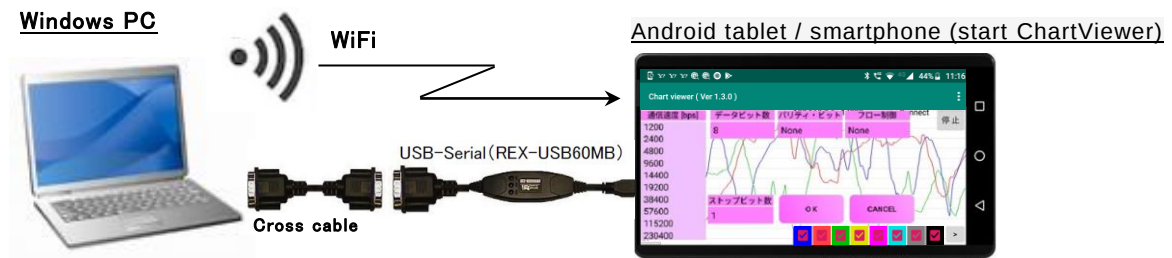


This part (the first data collected for offset correction) is No displayed.



9. Sample data transmission application

This is a Windows application that sends sample data of ChartViewer.



This app sends the following text data to WiFi (Socket communication by TCP/IP) or USB-Serial (RS-232C / UART) line.

0.04883,	-0.05762,	0.65894
0.04858,	-0.05737,	0.65918
0.04883,	-0.05737,	0.65942
0.04810,	-0.05664,	0.65991
0.04858,	-0.05664,	0.66089
0.04883,	-0.05713,	0.66089
0.05078,	-0.05615,	0.66016
0.05225,	-0.05664,	0.66162

* Send three values on one line, separated by commas (,).

Each value can be either a random value or a trigonometric (Sin, Cos, Tan) value.

Please refer to the following URL for the acquisition / details of this application.

URL : http://www.ne.jp/asahi/ajara/kojara/android_e.htm



10. Contact information

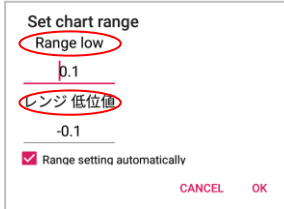
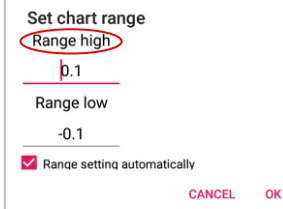
For inquiries about "Chart View", please add "Ajara:" to the beginning of the subject and send it to the following email address in Japanese.

`ajarakojara@kk.email.ne.jp`

We cannot accept non-Japanese language.



11. Change History

Version	Changes	Note
1.3.0	First edition	
1.3.1	In the English display (locale other than "ja"), the display error of the chart range setting dialog was corrected. [Before]  [After] 	Not applicable for Japanese display
1.3.2	The received text is no longer ignored when a numeric item contains illegal characters. [Before] Received text : " 1.23, 4.56, 3.14 // Comment " Separate text with commas (,), strip leading and trailing blanks, and split numeric items. The third numeric item is "3.14 // Comment", which is considered an invalid numeric expression. [After] Changed to ignore any character after blank in each split numeric item. "3.14 // Comment" is convert to "3.14". (Ignoring anything after the space)	If it contains an invalid numeric representation, the entire received text is ignored.