DSO 112A Digital Oscilloscope
Quick Guide   Rev. 02
— Panel and Connectors —

Attention

1. Battery voltage must be within 3.7V - 5V range.
2. Maximum input voltage is 50Vpk.
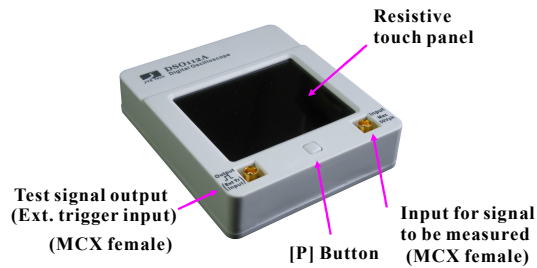3. Do not attempt to measure live power directly.

Resistive touch panel

Test signal output (Ext. trigger input) (MCX female)

[P] Button

Input for signal to be measured (MCX female)

Fig. 1

Packing List
- 1x DSO112A oscilloscope
- 2x MCX - clip cables
- 1x USB cable
- 1x 3.7V/1200mAh battery (optional)

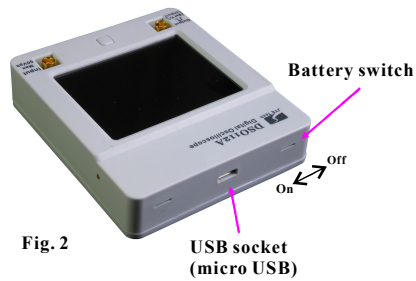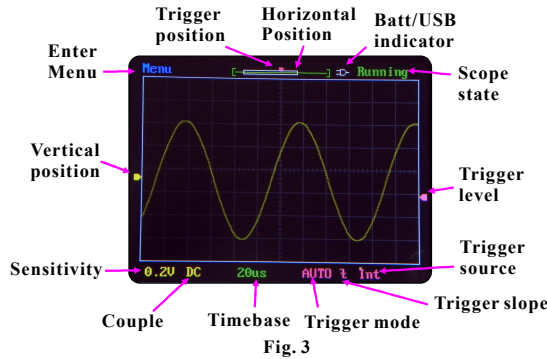**Tip:** It is recommended to charge battery for more than 10 hours before first time use.

Battery switch

Off

On

Fig. 2

USB socket (micro USB)

Enter Menu

Trigger position   Horizontal Position   Batt/USB indicator

Scope state

Vertical position

Trigger level

Sensitivity

Trigger source

Couple   Timebase   Trigger mode

Trigger slope

0.2V DC   20us   AUTO ↳ Int

Fig. 3

— Basic Operations —

1. Before first-time use
- Close the internal battery switch (see Fig.2) by sliding it towards the USB connector with a small stick.
- Charge battery for more than 10 hours by connecting the scope to a USB power.

2. Power On/Off
- **Power-on** Short press [P] button will turn DSO112 on.
- **Power-off** There are three ways to turn the unit off.
  1) Enter Menu and touch [Pwr Off] button.
  2) Hold [P] button for about 3 seconds under Running or Hold state.
  3) Hold [P] button for about 15 seconds under any state.

3. Connecting to signal to be viewed
- To view a signal first connect the black clip to the reference ponit (ground) of circuit under test. Then connect the red clip to the signal of interest.
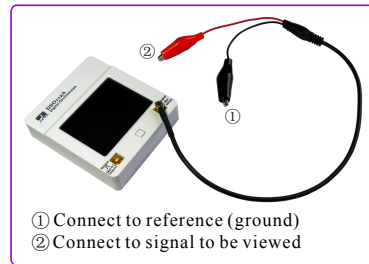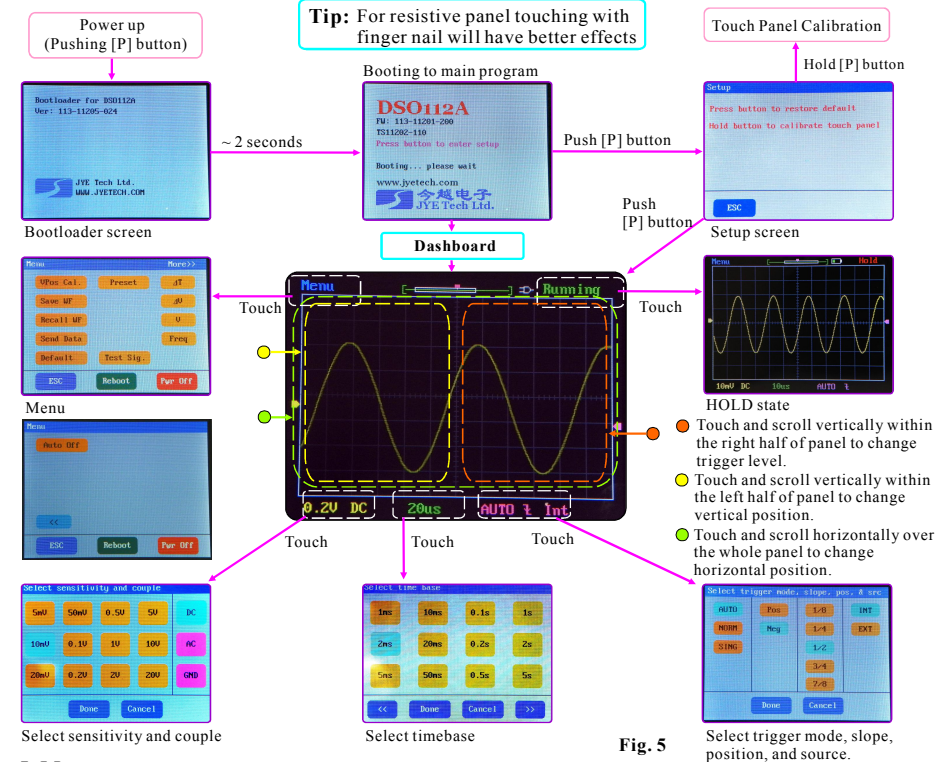
Auto Power Off

Oscilloscope will automatically shut down if running on battery and no touch activity for certain period of time. The factory default setting for this time is 2 min. It can be changed by entering Menu->More and touching AutoOff button.

① Connect to reference (ground)
② Connect to signal to be viewed

Fig. 4

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4. Use the Scope

Power up (Pushing [P] button)

Tip: For resistive panel touching with finger nail will have better effects

Touch Panel Calibration

Hold [P] button

Booting to main program

~ 2 seconds

Push [P] button

Bootloader screen

Push [P] button

Setup screen

Dashboard

Menu

Touch

Touch

HOLD state

- Touch and scroll vertically within the right half of panel to change trigger level.
- Touch and scroll vertically within the left half of panel to change vertical position.
- Touch and scroll horizontally over the whole panel to change horizontal position.

Touch   Touch   Touch

Select sensitivity and couple

5mV	50mV	0.5V	5V	DC
10mV	0.1V	1V	10V	AC
20mV	0.2V	2V	20V	GND
	Done	Cancel		

Select timebase

1ms	10ms	0.1s	1s
2ms	20ms	0.2s	2s
5ms	50ms	0.5s	5s
<<	Done	Cancel	>>

Select trigger mode, slope, position, and source.

Fig. 5

5. Menu

Buttons	Functions	Remarks
VPos Cal.	Align VPos indicator to 0V trace.	
Save WF	Save captured waveform data to internal EEPROM. The most recently captured data will be saved no matter this function is executed in Running state or Hold state.	The existing data in EEPROM will be over-written.
Recall WF	Recall saved waveform data from EEPROM. The parameters used for the data will also be recalled.	Recalled waveform is always displayed in Hold state.
Send Data	Send waveform data via serial connection (virtual COM port on USB). The most recently captured data will be sent.	Waveform data are sent in CSV file format. XModem protocol is used for the transfer. USB driver for CP2102 is required (refer to the section "USB Connection").
Default	Restore factory default settings for various parameters (except AutoOff time).	Press [P] button at Setup screen will also perform the same function.
Preset	Save or load preset scope parameters.	Navigate with "<<" and ">>" buttons. Touch a row to highlight it and use "Save" or "Load" button to execute.
DashBrd	Bring up dashboard for quick preset access.	
ΔT ΔV	Turn cursor ΔT or ΔV On/Off.	
V	Turn voltage read-outs On/Off. The unit of voltage read-out is the same as unit of vertical sensitivity.	Display Vmax, Vmin, Vpp, Vavr, and Vrms on screen. Not function when timebase is set to 50ms/div or slower.
Freq	Turn frequency read-out On/Off.	Display frequency on screen. Not function when timebase is set to 50ms/div or slower.
Test Sig.	Bring up "Test Signal Frequency" screen where test signal frequency can be changed.	Factory default setting: 1KHz
Auto Off	Bring up "Auto Power-off Time" screen where auto power-off time can be selected.	Factory default setting: 2 minutes

Advanced Operations

USB Connection
In order to use USB function the host which DSO112A is to communicate with is required to install driver supporting the USB-Uart bridge CP2102. Please use the following link to download driver and install it (refer to documents accompanying).

www.silabs.com/products/mcu/pages/usbtouartbridgevcpdrivers.aspx

Serial Port Parameters
For the main firmware serial port parameters are fixed to 115200 bps and 8-N-1.

For the bootloader serial port parameters are fixed to 9600 bps and 8-N-1.

Waveform Data Upload
Please refer DSO112A User Manual for detailed instructions.

The DSO112A User Manual is available at *www.jyetech.com*

△ T cursors and △ V cursors
△ T and △ V cursors can be turn on or off by touching [△T] or [△V] button at the menu screen.

To change cursor position touch the cursor you want to change to highlight it. Then touch anywhere of the panel and scroll horizontally (for △ T) or vertically (for △ V). You will see the highlighted cursor moves and readouts change accordingly (see Fig. 6 and Fig.78).

Note: The unit of △ T readout is the same as the current unit of timebase.

The unit of △ V readout is the same as the current unit of sensitivity.
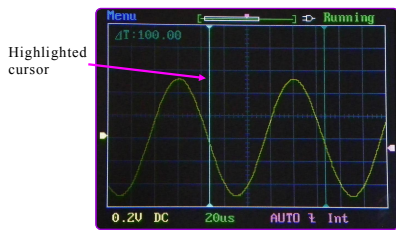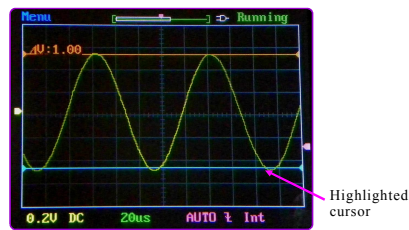
Highlighted cursor

Highlighted cursor

Fig. 6   **Fig. 7**

Presets
Preset Save/Load state is entered by touching [Preset] button at the menu. Touch a row to select (highlight) a location. Touching [Save] button will save current parameters to the selected location (existing data will be over-written). Touching [Load] will replace current parameters with that stored in the selected location (if not empty). Touch "Rename" at top to change the title of the selected preset.

External Trigger
External trigger input shares the same connector as test signal output (see Fig. 1). When trigger source is set to external the test signal will be disabled and trigger level will be displayed at top-right corner. When trigger source is switched back to internal the test signal will resume.

The allowed voltage range for external trigger signal is 0 - 15V.

Maintenance

Charging the Battery
DSO112A contains a built-in smart Li-ion battery charger. Simply connect the unit to USB power supply charging will start automatically. A red LED will light up (which can be seen from outside) indicating charge is undergoing. The charger will stop automatically once the battery is fully charged. (Fig. 8)
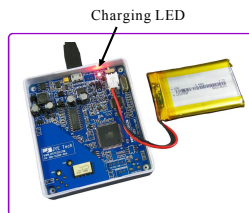
Charging LED

Fig. 8

Tech Support: *www.jyetech.com/forum*

Touch Panel Calibration
The touch panel has been calibrated before shipping. In case of the touch panel doesn't work properly it can be re-calibrated. Please follow the steps below to perform touch panel calibration.

1) Power up the scope. At the main booting screen push [P] button to enter Setup mode.

2) Press and hold [P] button in Setup mode to enter touch panel calibration state, as shown in Fig. 9.

3) Use a pointed object to touch the center of each cross 8 times, as accurately as you can. You will see three crosses, one after another. Do not touch more than 8 times for each cross.

4) After you finish the third cross touch anywhere of the panel to verify. You should see a small green cross follows the points you touch with some error (the error is usually smaller than 1mm). If you see the errors larger than 2mm you can re-do the calibration.
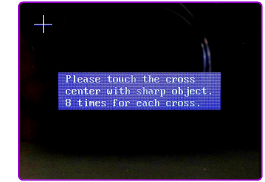
5) Exit calibration by pressing [P] button.

Fig. 9

Upgrading Firmware
New firmware can be downloaded to DSO112A by the pre-installed Bootloader. Please follow the steps below to perform firmware change.

1) Download new firmware (it is a file with ".hex" extension) to you computer.

2) Download **avrubd.exe** at *http://www.jyetech.com/Support/avrubd.rar* and install it to your computer.

3) Connect DSO112A to PC via USB and power up.

4) Start avrubd. At Option - System tab select "Lite XModem" as communication protocol and set maximun connect count to 100 (see Fig. 10).

5) At Option - Comport tab select the com port number corresponding to your scope and set parameters to 9600 baudrate, 8 data bits, 1 stop bit, and no parity (see Fig. 11).
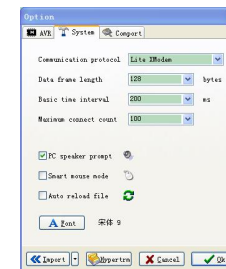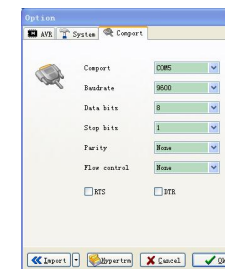
Load HEX file

Download

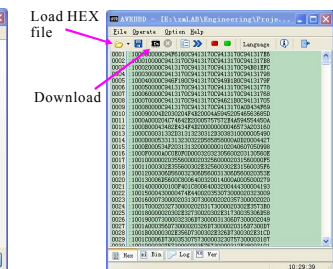**Fig. 10**   **Fig. 11**   **Fig. 12**

6) Click on the Open File icon to load into avrubd the new firmware you have downloaded. Click on the download icon to start downloading (see Fig. 12). You should see avrubd is talking to oscilloscope by sending connection key continuously.

7) At DSO112A enter Menu and touch the button [Reboot] . Bootloader will be entered and answer to avrubd. If successful you should see download starts and progresses in avrubd. After all data have been downloaded the scope re-starts and upgrading is done.

Specifications

* Analog bandwidth: 0 – 2MHz
* Max sampling rate: 2.5Msps
* Sensitivity range: 2mV/Div – 20V/Div
* Sensitivity error: < 5%
* Timebase range: 1μs/Div – 50s/Div
* Max input voltage: 50Vpk
* Record length: 512/1024 points
* Input impedance: 1MΩ
* Current consumption: ~300mA (@3. 7V)
* Dimension: 80 x 70 x 18 mm