

ARM DSO Nano Manual

ver1.5b



DSO mobile is a pocket size digital storage oscilloscope fulfills basic electronic engineering requirement. It is base on ARM [Cortex™-M3](#) compatible 32 bit platform, equipped with 320*240 color display, SD card capability, USB connection, and 3.7v chargeable batteries.

Features

- Super portable and lightweight
- 2.8" color 320*240 display
- Micro SD card Waveform Storage
- Basic 1Msps sample rate with 12bit resolution
- Various measurement markers
- Various trigger mode
- Build-in test signal
- USB chargeable battery
- Open source

Specification

| | |
|------------------------|---|
| Display | ST7781 2.8" Color TFT LCD |
| Display Resolution | 320x240 |
| Display Color | 65K |
| Analog bandwidth | 0 - 1MHz |
| Max sample rate | 1Msps 12Bits |
| Sample memory depth | 4096 Point |
| Horizontal sensitivity | 1uS/Div 10S/Div (1-2-5 Step) |
| Horizontal position | adjustable with indicator |
| Vertical sensitivity | 10mV/Div 10V/Div (with x1 probe) |
| | 0.5V/Div 10V/Div (with x10 probe) |
| Vertical position | adjustable with indicator |
| Input impedance | >500KΩ |
| Max input voltage | 80Vpp (by x1 probe) |
| Coupling | DC |
| Trig modes | Auto, Norma, Single, None and Scan |
| Functionalities: | Automatic measurement: frequency, cycle, duty, Vpp, Vram, Vavg and DC voltage |
| | Precise vertical measurement with markers |
| | Precise horizontal measurement with markers |
| | Rising/falling edge trigger |
| | Trig level adjustable with indicator |
| | Trig sensitivity adjustable with indicator |
| | Hold/run feature |
| Test signal | Built-in 10Hz 1MHz (1-2-5 Step) |
| Waveform storage | SD card |
| PC connection via USB | as SD card reader |
| Upgrade | by bootloader via USB |
| Power supply | 3.7V Chargeable Lithium battery / USB |
| Dimension (w/o probe) | 105mm X 53mm X 8mm |

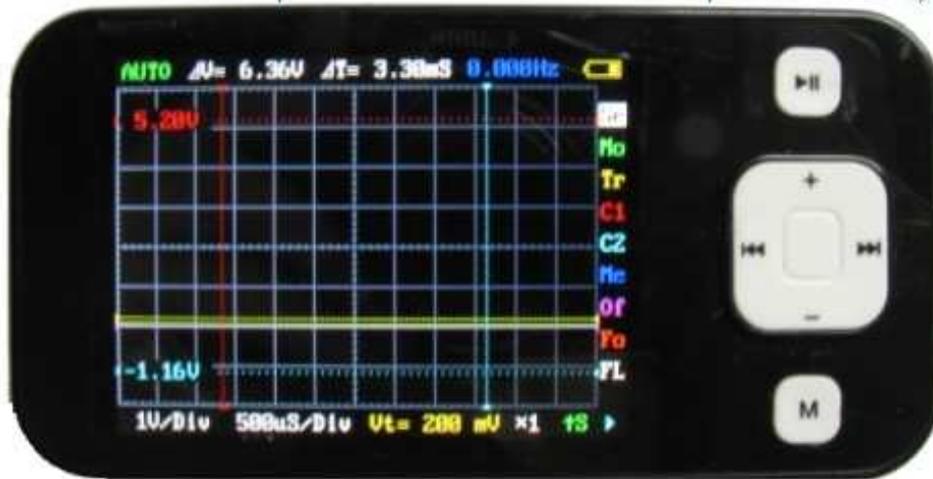
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53mm

320*240 TFT LCD Display

Power Switch

50Hz Square Wave

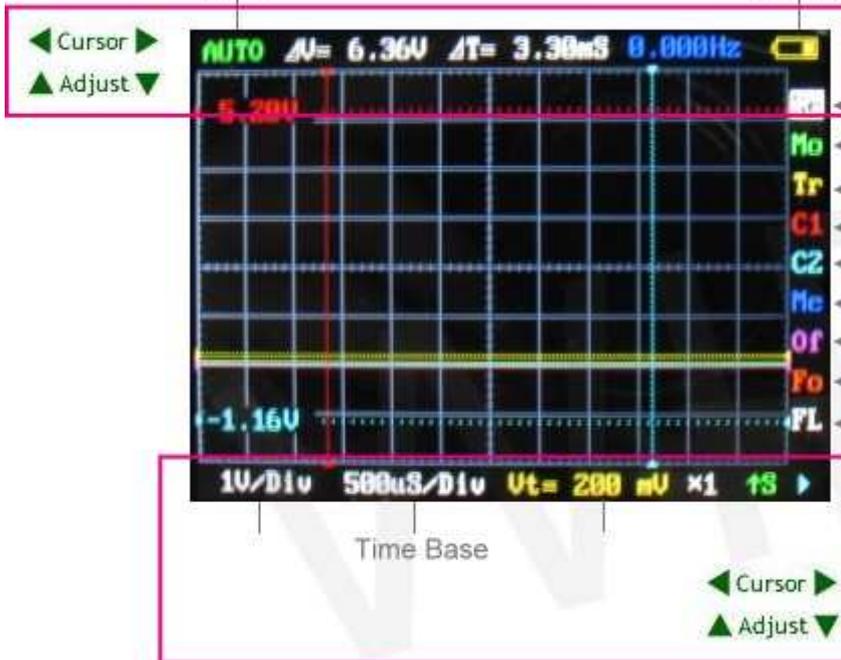


- Run/Stop Button
- Probe jack
- Navigation/Adjustment buttons
- Mini USB port
- Memory Button

105mm

Status

3.7v Cell



- ◀ Adjust ▶
- ▲ Cursor ▼
- SE settings: X,Y Sensitivity
- MO settings: scan mode, trigger mode
- Tr settings: trigger level, trigger sensitivity
- C1 set: cross cursor 1 position
- C2 settings: Cross Cursor 2 Position
- Me Select; measurement display mode
- Of set: x-axis offset, y-axis offset
- Fo settings: the output pulse frequency
- FL: File Operations (For SD Card)

Time Base

- ◀ Cursor ▶
- ▲ Adjust ▼

SE settings: vertical stalls, stalls level, multiple probe

Click the up and down, left and right gear to achieve vertical and horizontal adjustment of stalls;
Long by up and down, left and right position adjustment to achieve;
Long press M button to select multiple probes;
Play starts scanning short or suspended by scanning,
Press and Play show or hide all measurements.

MO settings: scan mode, trigger mode

Select trigger mode by up and down, left and right select the scan mode;
Play starts scanning short or suspended by scanning,
Press and Play directly to the SE menu.

Tr settings: trigger level, trigger sensitivity

Adjusted by the upper and lower trigger level, so adjust the trigger sensitivity.
Press and M blanking trigger line;
Play starts scanning short or suspended by scanning,
Press and Play directly to the SE menu.

C1 set: cross cursor 1 position

Cursor up and down to adjust the level by 1, so adjust the vertical cursor 1.
"M" blanking press and move the cursor on the last instruction value -> blanking on the last move of the cursor and the direction value -> display the last move of the cursor on and Direct numerical;
Play starts scanning short or suspended by scanning,
Press and Play directly to the SE menu.

C2 settings: Cross Cursor 2 Position

Cursor up and down to adjust the level by 2, so adjust the vertical cursor 2.
"M" blanking press and move the cursor on the last instruction value -> blanking on the last move of the cursor and the direction value -> display the last move of the cursor on and Direct numerical;
Long press Play button to return to cross cursor 1 Menu

Me Select: measurement mode, set the measurement display mode

Selected by measuring the content of the upper and lower,
Long right-click shows all measurements,
Long press left hidden;
Play starts scanning short or suspended by scanning,
Press and Play directly to the SE menu.

Of set: x-axis offset, y-axis offset

Press down to adjust the vertical offset, so adjust the level of migration.
M blanking offset by the level of long reference line;
Play starts scanning short or suspended by scanning,
Press and Play directly to the SE menu.

Fo settings: the output pulse frequency

Press down to adjust the output frequency;
Play starts scanning short or suspended by scanning,
Press and Play directly to the SE menu.

FL: File Operations

Right click choose save, left click to select the reading, press down the selection process number,
press "M" the implementation of selected operations;
Long press down the button, move the reference waveform locations,
Long press the left button, hidden reference waveform,
Long press the right button to display the reference waveform.
Play starts scanning short or suspended by scanning,
Press and Play directly to the SE menu.

Click the "M" switching table; a long time does not operate to automatically back to SE menu.

Save method parameters: Set a good start after at least 5 minutes to ensure, or can function in non-SE long press PLAY button under the table until you are prompted;

Hold down the "M" key to boot, you can use the default settings.
Time increment between two time the cursor into the frequency display function:

C1 or C2 in the next menu, click the down button can display time, display frequency, automatically switching between three modes alternately.

Voltage correction to use:

a) zero correction, Hold down the left-turn, short the probe, open the measurement display.
Press down button to select the correct short-stalls, short press the left or Right to show the average voltage closest to 0V.

b) Gain correction

Prepare a reference power, hold down the right boot, then the probe base power, open the measurement display. Press down button to select short.
Correction of stalls, short press the left or right to display the average voltage closest to the reference power value.

To achieve the best results, repeat this process several times, after a short press "M" key once, then press play button to save long.

Hold down the "M" key as the boot, will not use the information stored in the correction.

To avoid the slow USB charging oscilloscope display, the normal boot will be shielded USB communications, PC will be displayed at this time does not recognize the USB device

To use USB communications, press and hold the **PLAY** key to boot.

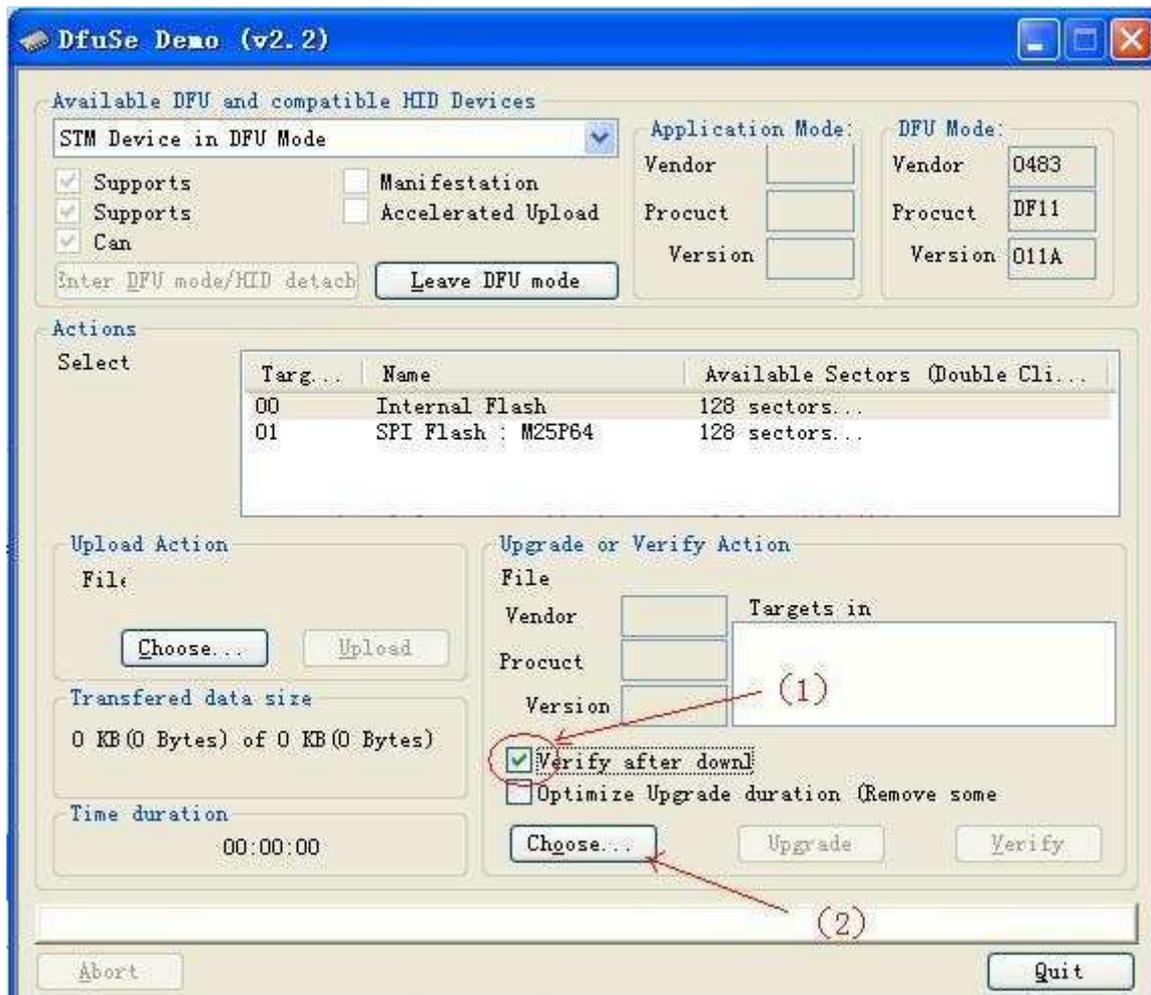
Firmware upgrade

It's easy to upgrade firmware with USB bootloader.

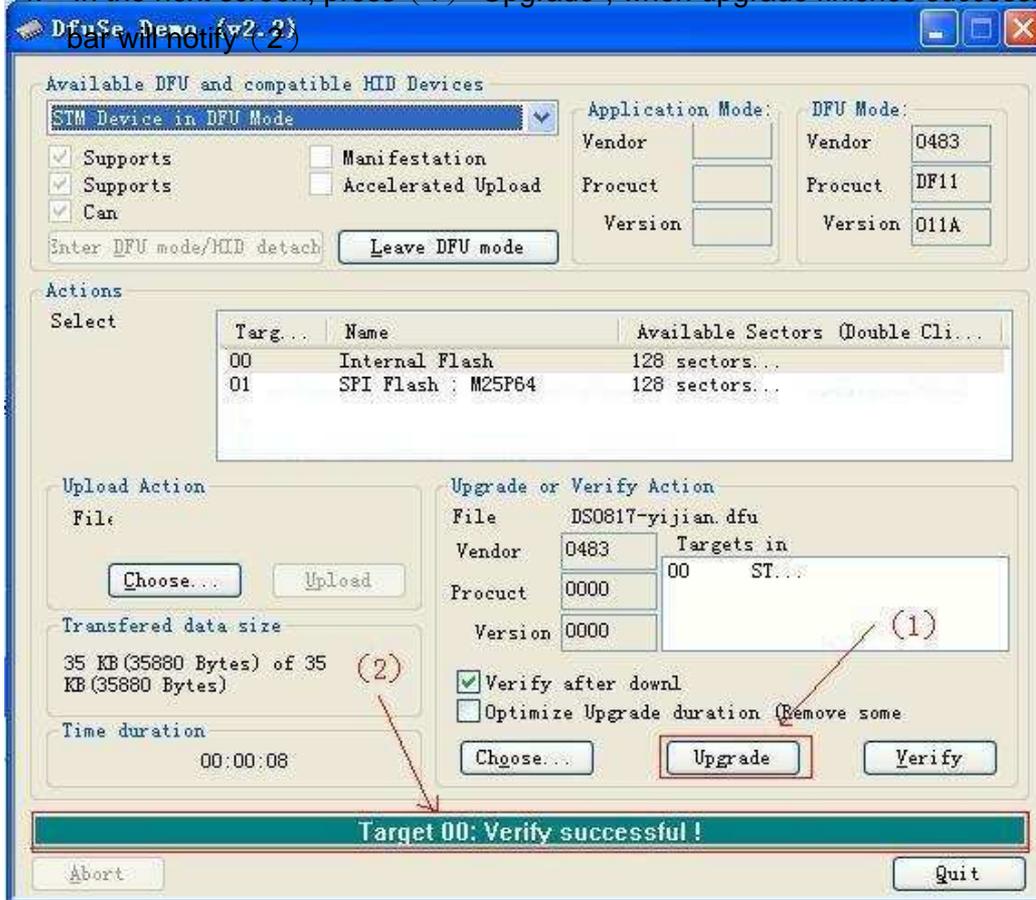
1. Download "DfuSe USB Device Firmware Upgrade" from <http://www.st.com/stonline/products/support/micro/files/um0412.zip> and install. Instruction available at <http://www.st.com/mcu/familiesdocs-110.html#Application%20Note>.

2. Connect Oscilloscope with PC, press and hold **—**, switch on power, until oscilloscope displays:
"Please Connect to USB Host!"
"DS0201 Device Firmware Upgrade Ver 2.0"
When PC connection is detected,
"Firmware Upgrading..."
"Please Wait"
"DS0201 Device Firmware Upgrade Ver 2.0"

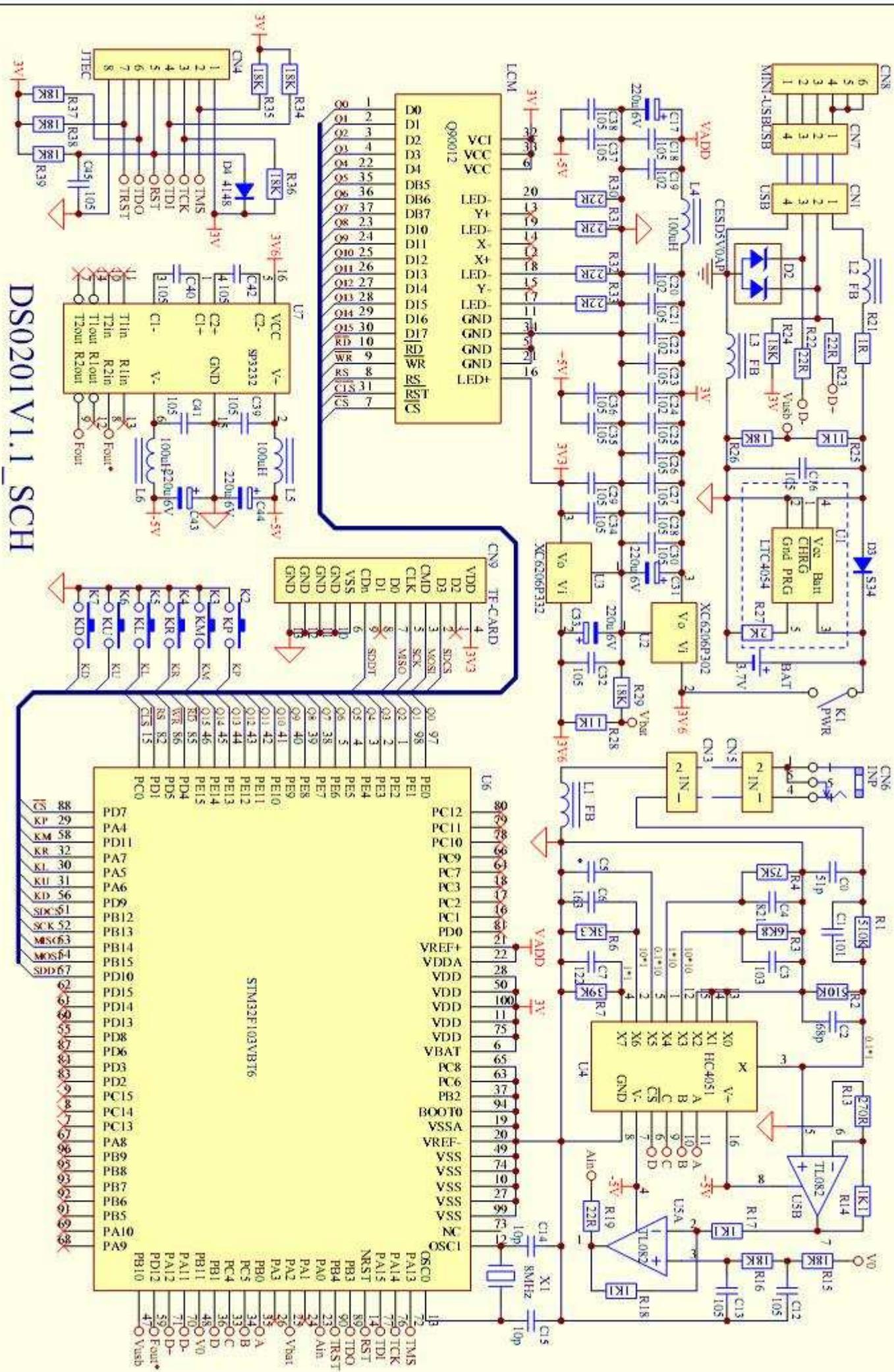
3. Run "DfuSe Demonstration" on your PC, check (1), select firmware to be uploaded (e.g."DS0201_FW_V2.00.DFU") at (2)



- In the next screen, press (1) "Upgrade", when upgrade finishes successfully, status bar will notify (2)



- Shut down and reactivate power to use new firmware.

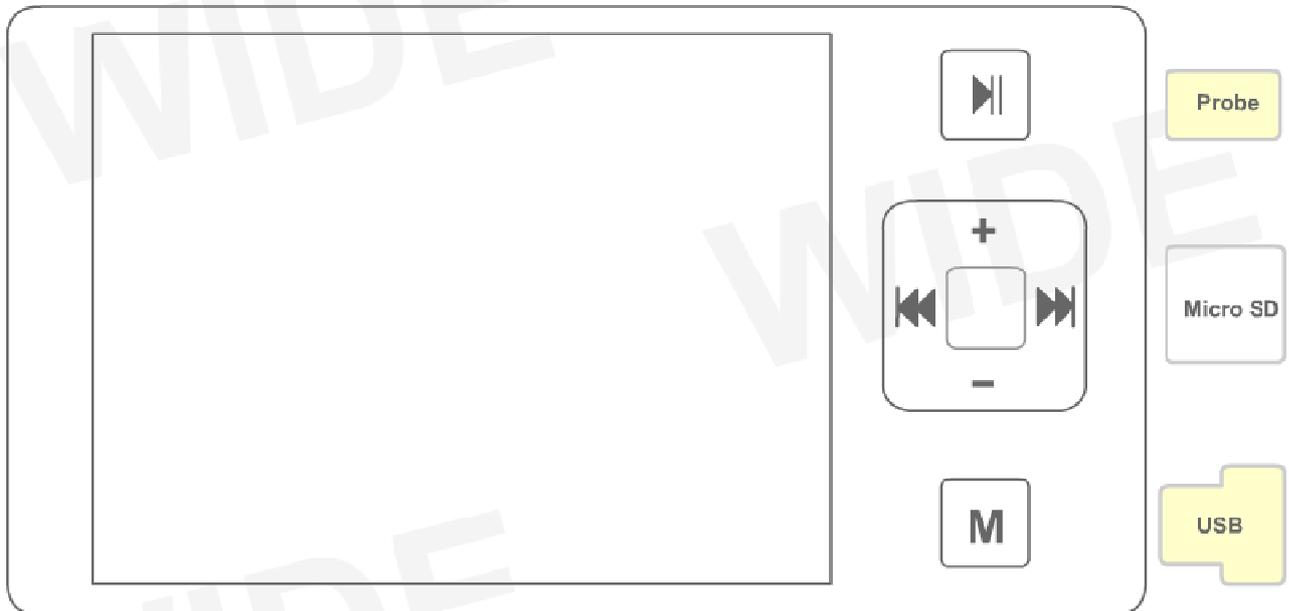


DS0201 V1.1_SCH

STM32F103VBT6

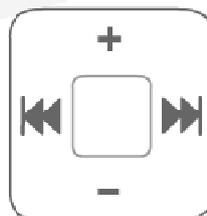
ARM DSO Nano - Pocket-Sized Digital Oscilloscope

Firmware is updated.



 Run/Stop

 Menu



Value / Frequency
(Div/Khz/Vo/us/ms/...)

How to Charger the Battery ?

Turn off the power of DSO Nano , Connected the USB with PC or USB power adapter

How to Connected with PC ?

Turn off the power ,Connected with USB to PC. Hold the Key " - " and Turn on the power