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!

!SDG1000X Modification instructions V33R1 2019 by @Li XiuYing

! This is fully fictional and only you are responsible how ever you use what ever inside this fiction.

! **Part I** (end of Part I is short form instructions **for experienced users, just jump over to this**)

!
!

Modify SDG1032X to SDG1062X

!
!
!
!
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!
!

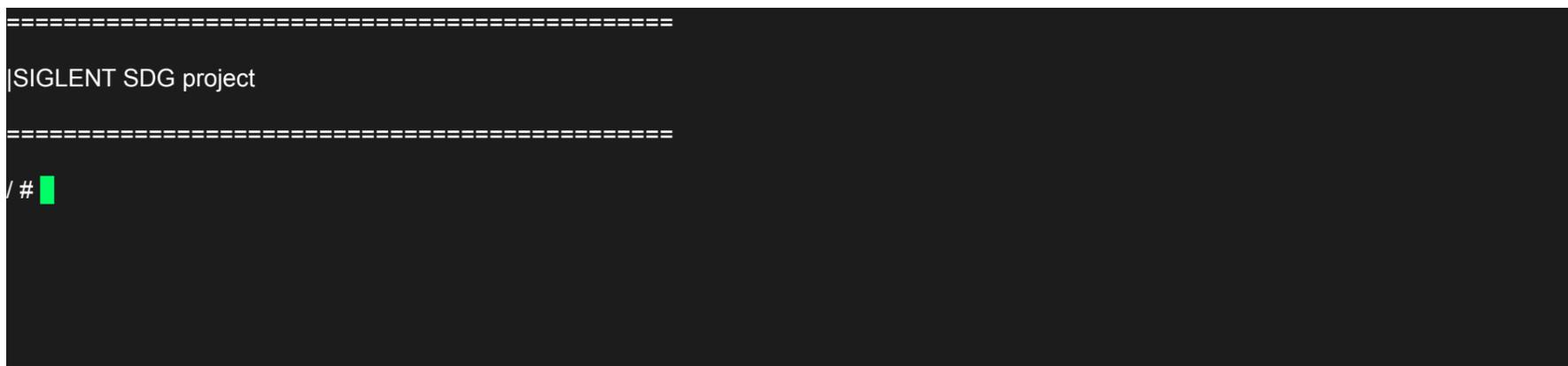
Your SDG1000X run with official FW 1.01.01.33R1 (unknown login and password for telnet)
Do not anymore use modified FirmWares with known login and password. Perhaps you still can find these files but they are obsolete and not anymore useful. They do not have bug fixes and new features.
How to do? There is solution. EEVblog member "tv84" have published "telnet_SDG1000X.zip" what opens connection and this do not need login user and password at all.

!
!
!
!
!
!
!
!
!
!

For this work you need connect PC and SDG with LAN cable. My recommendation is direct LAN cable.
Also you need suitable terminal software for **telnet connection**
One is PuTTY, and it is good. (do not use windows total shit "terminal". No, no and NO!)
Also you can configure PuTTY as you like and need. All can adjust.
Only need is just Telnet client. For this you need only **puttytel.exe** (the SSH and Telnet client itself)
IP number you find in SDG1000X menu. Connect terminal (PuTTY) to this IP. **Port = 10101** (tv84's script open this port)
Login: no need Password : no need

All rows what begin with ! they are my comments.

!
! In command lines after #, **bolded strings are what you type or can cypaste to PuTTY cursor position** and then push <enter>
! Note: it is best to use text editor like notepad++ or notepad etc so that it do not copy any hidden control characters.
! **In this zip packet is also plain .txt file, just this same but plain text without any hidden control characters etc in file.**
! (for cypaste commands etc please use this .txt file)
! After it is connected succesfully your PuTTY terminal window show with blinking cursor (green in this example)
! when you see this screen you are in and ready for operations:



! Let's start (use plain txt instruction file and cypaste to cursor.

! / # **mount -o remount,rw ubi2_0 /usr/bin/siglent/firmdat0**

! / # **cd /usr/bin/siglent/firmdat0**

!
! this next cp (copy) is mandatory for keep your original for return back to factory state
! this file include your serial number and important license key what only Siglent can produce.
!

! /usr/bin/siglent/firmdat0 # **cp NSP_system_info.xml NSP_system_info.xml.orig**

! this next cp (copy) is not mandatory, but for safe and for possible future use this is how I do

! /usr/bin/siglent/firmdat0 # **cp NSP_system_info.xml NSP_system_info.xml.orig.backup**

! then we can check what we have now

! /usr/bin/siglent/firmdat0 # **ls**

! after ls you see something like this:

NSP_system_info.xml
NSP_system_info.xml.orig
NSP_system_info.xml.orig.backup
NSP_trends_config_info.xml
cali_date
version.txt

! **Now we go to modification.** NSP_system_info.xml need small editing.
! we need do it using vi editor. After command it open vi editor like here
! and cursor is blinking beginning of file.

! **A1**

```
/usr/bin/siglent/firmda0 # vi NSP_system_info.xml
```

```
<?xml version="1.0" encoding="UTF-8"?>  
<nsp_system_info_root>  
  <device>  
    <system_information>  
      <serial_number>  
        <chip>SDG1YOURSERIAL</chip>  
      </serial_number>  
      <license><bandwidth_update_license>YOURXXLICENSEKEY</bandwidth_update_license></license></system_information>  
    </device>  
  </nsp_system_info_root>
```

! At this time use vi editor:
! you can move cursor using arrow keys. You need exactly delete there in file text what is highlighted.
! This is so simple edit that you can do it with these commands
! **r** replace single character under cursor (example if there read abcdef and cursor is blinking position c.
! Now type **r** and then **8**. After then there read ab8def)
! **x** delete single character under cursor
! **Nx** delete **N (numeric value)** characters, starting with character under cursor
! (use arrow keys to position cursor to first character (<) of <licens... row and
! then type 85 (you do not see it) and then press x so text is deleted nearly enough (I do not know if key length is constant)
! and then press x so many times rest is deleted exactly but not </system_information>
! Remember if something goes wrong you can always go out from vi without modifications using vi command **:q!**

! Of course there is many advanced vi editor commands what can use. This is simple bullet proof method for
! peoples who are not at all familiar with linux and vi)

! Final result need look like this:

```
<?xml version="1.0" encoding="UTF-8"?>  
<nsp_system_info_root>  
  <device>  
    <system_information>  
      <serial_number>  
        <chip>SDG1YOURSERIAL </chip>  
      </serial_number>  
    </system_information>  
  </device>  
</nsp_system_info_root>
```

! If all is exactly ok then command inside vi:
! **:wq** <Return> quit vi, writing out modified file to file named in original invocation

! If something is wrong and you want begin again with unmodified
! **:q!** <Return> quit vi even though latest changes have not been saved for this vi call
! After this go back and start vi again as told previously (position after A1).

! After both cases you quit vi and you see this:

```
/usr/bin/siglent/firmda0 #
```

! if you are here for repeat editing again then go back to position **A1**
! if you have edited it ok and then you want just check it without vi editor
! (of course vi can also use for only check. Just after reading terminate vi without any changes using **:q!**)

! This part is not mandatory, it is only example how to check/read file

! For just check it without vi editor then you can use also **cat** like this:

```
/usr/bin/siglent/firmda0 # cat NSP_system_info.xml
```

```
<?xml version="1.0" encoding="UTF-8"?>  
<nsp_system_info_root>  
  <device>  
    <system_information>  
      <serial_number>  
        <chip>SDG1YOURSERIAL</chip>  
      </serial_number>  
    </system_information>  
  </device>  
</nsp_system_info_root>  
/usr/bin/siglent/firmda0 #
```

! This next is not mandatory but this I do. If want, just jump over and finish this modification, jump over to **A2** (next page)

! If all is now ok then we can also make some copy files for possible future needs
! for avoid accidental edit or rename if some days need swap between FW versions
! and/or perhaps do some other modifications in system.

```
/usr/bin/siglent/firmda0 # cp NSP_system_info.xml NSP_system_info.xml.mod  
/usr/bin/siglent/firmda0 # cp NSP_system_info.xml NSP_system_info.xml.mod.backup
```

! Next page

! A2

! After then we can go back to / directory

```
/usr/bin/siglent/firmda0 # cd /
```

! Mandatory in some cases and if not still good practice always:
! in most embedded systems, your OS will be running from something like an SD card or flash
! and you may be subject to unexpected power loss. When you're editing files or making changes
! in the filesystem, some of these edits and/or changes are only written to buffer cache,
! not the flash disk (not yet anyways). sync will force the system to commit the buffer cache to the disk.

```
/ # sync
```

! after then exit PuTTY (also can just shut off PuTTY)

```
/ # exit
```

! Now you can power off your SDG1032X, wait 10 secons and then power on.
! Note: tv84 .ADS need install again always after restart if need this telnet connection
! When all is ok you can look
! Utility:System:Page 2:SystemInfo and there you see it is SDG1062X
!
! Happy now?
! Ok -- it works now as SDG1062X, is it possible to do some more?
! Yes, it is. Read **Part II** modifications for limits ;)

!=====

As you see there is not so much.....

! Part I SDG1032X to SDG106X modification for experienced users

! = comment

! Using EEVblog member "tv84" published .ADS what opens
! connection (telnet port number 10101) and this do not need login user and password at all. Using LAN PC<==>SDG1032X

```
/ # mount -o remount,rw ubi2_0 /usr/bin/siglent/firmda0  
/ # cd /usr/bin/siglent/firmda0  
/usr/bin/siglent/firmda0 # cp NSP_system_info.xml NSP_system_info.xml.orig  
/usr/bin/siglent/firmda0 # vi NSP_system_info.xml
```

!
! Using vi, delete just exactly all between " " but nothing else
! "<license><bandwidth_update_license>YOURLICENSEKEY11</bandwidth_update_license></license>"

```
/usr/bin/siglent/firmda0 # cd /  
/ # sync  
/ # exit
```

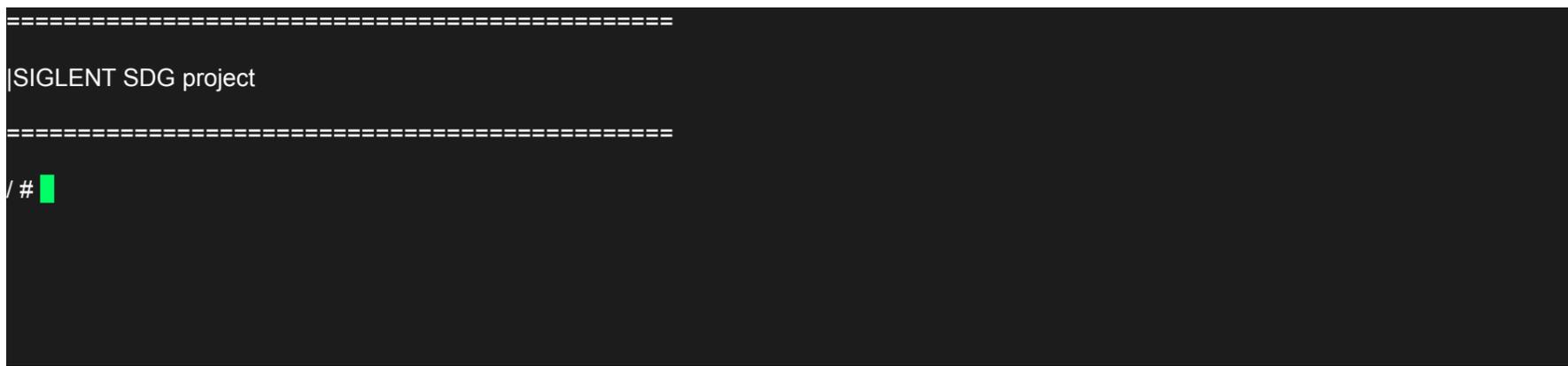
! after then power off, 10 seconds and then on.
! tv84 .ADS need install again always after restart if need this telnet connection

! 2019 @ Li XiuYing

```

=====
!   SDG1000X Modification instructions V33R1                               by 2019 @Li XiuYing
!   This is fully fictional and only you are responsible how ever you use what ever inside this fiction.
!   Part II (this is independent of SDG1032X to model SDG1062X modification Part I)
!
!   Modifications for SDG1032X or SDG1062X some functions limits.
!
!   Your SDG1000X run with official FW 1.01.01.33R1 (unknown login and password for telnet)
!   Do not anymore use modified FirmWares with known login and password. Perhaps you still can find these
!   files but they are obsolete and not anymore useful. They do not have bug fixes and new features.
!   How to do? There is solution. EEVblog member "tv84" have published "telnet_SDG1000X.zip" what opens
!   connection and this do not need login user and password at all.
!
!   For this work you need connect PC and SDG with LAN cable. My recommendation is direct LAN cable.
!   Also you need suitable terminal software for telnet connection
!   One is PuTTY, and it is good. (do not use windows total shit "terminal". No, no and NO!)
!   Also you can configure PuTTY as you like and need. All can adjust.
!   Only need is just Telnet client. For this you need only puttytel.exe (the SSH and Telnet client itself)
!   IP number you find in SDG1000X menu. Connect terminal (PuTTY) to this IP. Port = 10101 (tv84's script open this port)
!   Login: no need      Password : no need
!
!   All rows what begin with ! they are my comments.
!
!   In command lines after #, bolded strings are what you type or can copypaste to PuTTY cursor position and then push <enter>
!   Note: it is best to use text editor like notepad++ or notepad etc so that it do not copy any hidden control characters.
!   In this zip packet is also plain .txt file, just this same but plain text without any hidden control characters etc in file.
!   (for copypaste commands etc please use this .txt file)
!   After it is connected successfully your PuTTY terminal window show with blinking cursor (green in this example)
!   when you see this screen you are in and ready for operations:

```



! **Let's start (use plain txt instruction file and copypaste to cursor.**

! **note: next mount command is different as used in Part I**
! **So, please be very careful and do not accidentally make unwanted changes in system, there is no recovery.**

```

!   / # mount -o remount,rw /
!   / # cd /usr/bin/siglent/config

```

! this next cp (copy) is important for keep your original for return back to factory state

```

!   /usr/bin/siglent/config # cp NSP_limit_data.xml NSP_limit_data.xml.orig

```

! this next cp (copy) is not mandatory, but for safe and for possible future use this is how I do

```

!   /usr/bin/siglent/config # cp NSP_limit_data.xml NSP_limit_data.xml.orig.backup
!   /usr/bin/siglent/config # vi NSP_limit_data.xml

```

! after this command you see this file for edit.
! Edit it. (if you need insert use command **i** it add character(s) before cursor position. Command **i** is terminated pushing <Esc>)
! You can easy find Vi editor commands. Just google "vi editor commands"
! Below is listed original factory made NSP_limit_data.xml
! For some limits there is example **!!>values<!!** what you can try.
! After all edited ok then inside vi editor command
! **:wq<enter>**

```

!   / # sync
!   / # exit

```

! Now you can power off and on SDG1000X and after then new limits are in use. Note: FW update overwrite these
! Next page part of original NSP_limit_data.xml and tested example values what can use are between **!!>new value<!!**
! You change **these original** values.

! If you want only look it, just use command cat

```

!   /usr/bin/siglent/config/ # cat NSP_limit_data.xml

```

! About [NSP_limit_data.xml] FW 33R1 file in directory: /usr/bin/siglent/config/
 ! When you open it for editing using vi, you can see here is first some text. DO NOT TOUCH! If you cat this file, just do not care

```

<limit_data_root>
  <ch_0>
    <bswv>
      <public>
        <min_frq>0</min_frq>
        <min_amp>2e-3</min_amp>
        <!-- amp -->
        <match_amp_1>20</match_amp_1>
        <match_frq_1>10e6</match_frq_1> ! Warning: DO NOT change these freq related amplitude level limits
        <match_amp_2>10</match_amp_2> ! Higher values may lead permanent internal thermal over stress damage
        <match_frq_2>60e6</match_frq_2>
      </public>
      <sine>
      </sine>
      <square>
        <max_frq>60e6</max_frq>
      </square>
      <ramp>
        <max_frq>500e3</max_frq> !! 5e6<!! Triangle/Ramp max 5MHz
      </ramp>
      <pulse>
        <max_frq>12.5e6</max_frq>
        <min_width>32.6e-9</min_width>
        <min_edge>16.8e-9</min_edge> !! 11.8e-9<!! Pulse rise/fall minimum limit 11.8ns (note 1)
        <edge_coef>0.625</edge_coef>
        <width_dev>11.6e-9</width_dev>
      </pulse>
      <noise>
      </noise>
      <dc>
        <max_offset>10</max_offset>
        <min_offset>-10</min_offset>
      </dc>
      <arb>
        <max_frq>6e6</max_frq> !! 10e6<!! Arbitrary repeating freq max 10MHz
        <max_sample_rate>30e6</max_sample_rate>
      </arb>
    </bswv>
    <burst>
      <min_frq>2e-3</min_frq>
    </burst>
    <sweep>
      <min_frq>1e-6</min_frq>
      <min_sweep_time>1e-3</min_sweep_time>
      <max_sweep_time>500</max_sweep_time> !! 100000<!! Max sweep time 100ks (over 27 hour)
    </sweep>
    <mod>
      <public>
        <min_frq>1e-3</min_frq>
        <min_mod_frq>1e-3</min_mod_frq>
        <max_mod_frq>20e3</max_mod_frq> !! 50e3<!! Max AM, FM, PM internal modulation frequency 50kHz
      </public>
      <am>
        <min_am_depth>0</min_am_depth>
        <max_am_depth>120</max_am_depth>
      </am>
      <fm>
      </fm>
      <pm>
      </pm>
      <ask>
        <max_mod_frq>50e3</max_mod_frq>
      </ask>
      <fsk>
        <max_mod_frq>50e3</max_mod_frq>
      </fsk>
      <dsb-am>
      </dsb-am>
      <psk>
      </psk>
      <pwm>
      </pwm>
    </mod>
  </ch_0>
  <frq_counter>
    <min_dc_frq>0.1</min_dc_frq>
    <max_dc_frq>200e6</max_dc_frq> !! 250e6<!! Max counter frequency 250MHz (small drop in....
    <min_ac_frq>10</min_ac_frq>
    <max_ac_frq>200e6</max_ac_frq> !! 250e6<!! ....sensitivity over 200MHz frequencies)
  </frq_counter>
</iq><max_amp></max_amp><min_amp></min_amp><max_sample_rate></max_sample_rate><min_symbol_rate></min_symbol_rate><max_center_frq></max_center_frq><min_center_frq></min_center_frq><max_gain_balance></max_gain_balance><min_gain_balance></min_gain_balance><max_Q_Angle></max_Q_Angle><min_Q_Angle></min_Q_Angle><max_offset></max_offset><min_offset></min_offset></iq></limit_data_root>

```

! IMPORTANT: remember sync before exit PuTTY and boot SDG
 ! by 2019 @Li XiuYing

note 1: 16.8n is factory optimal limit. More fast may add more rise/fall time jitter (pulse edges angle jitter (ADC clock is only 150MHz))